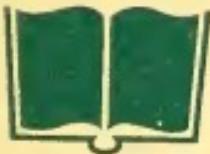


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MDCCXLIX.



GEOGRAPHICAL MEMOIR.

ON the second day of February, in the year 1847, during my absence on my third expedition of topographical survey, in the western part of this continent, a resolve was passed by the Senate directing the construction of two maps—one of the central section of the Rocky mountains, and the other of Oregon and Upper California—from the materials collected by me in the two previous expeditions, and with the additions which the then existing expedition might furnish; and Mr. Charles Preuss, my assistant in the first and second expeditions, was employed to commence the work.

On my return to the United States, in the month of September last, I found Mr. Preuss closely engaged upon the work on which the Senate had employed him; and, from that time to the present, I have myself given all the time that could be spared from other engagements to supply the additions which the last expedition has enabled me to make. Conceiving that the map of Oregon and California was of the most immediate and pressing importance, I first directed my attention to its preparation, in order to bring it into a condition as soon as possible to be laid before the Senate; which is now done.

In laying this map of Oregon and Upper California

before the Senate, I deem it proper to show the extent and general character of the work, and how far it may be depended on as correct, as being founded on my own or other surveys, and how far it is conjectural, and only presented as the best that is known.

In extent, it embraces the whole western side of this continent between the eastern base of the Rocky mountains and the Pacific ocean, and between the straits of Fuca and the gulf of California, taking for its outline, on the north, the boundary line with Great Britain, and on the south, including the bay of San Diego, the head of the gulf of California, the rivers Colorado and Gila, and all the country through which the line of the late treaty with Mexico would run, from *El Paso del Norte* to the sea. To complete the view in that quarter, the valley of the Rio del Norte is added, from the head of the river to *El Paso del Norte*, thereby including New Mexico. The map has been constructed expressly to exhibit the two countries of Oregon and the Alta California together. It is believed to be the most correct that has appeared of either of them; and it is certainly the only one that shows the structure and configuration of the interior of Upper California.

The part of the map which exhibits Oregon is chiefly copied from the works of others, but not entirely, my own explorations in that territory having extended to nearly two thousand miles. The part which exhibits California, and especially the Great Basin, the Sierra Nevada, the beautiful valley of Sacramento and San Joaquin, is chiefly from my own surveys or personal view, and in such cases is given as correct. Where my own observations did not extend, the best authorities have been followed.

The profile view in the margin, on the north side of the map, exhibits the elevations of the country from the *South Pass* in the Rocky mountains to the bay of San Francisco, passing the Utah and the Great

Salt lake, following the river Humboldt through the northern side of the Great Basin, crossing the Sierra Nevada into the valley of the Sacramento, where the emigrant road now crosses that sierra forty miles north of Nueva Helvetia. This line shows the present travelling route to California. The profile on the south side of the map exhibits the elevations of the country on a different line—the line of exploration in the last expedition—from the head of the Arkansas by the Utah and Salt lake, and through the interior of the Great Basin, crossing the Sierra Nevada into the Sacramento valley at the head of the *Rio de los Americanos*. These profile views are given merely for their *outlines*, to show the structure of the country between the Rocky mountains and the sea, and the rise and fall occasioned by mountains and valleys. Full and descriptive profile views on a large scale are wanted, marking the geological structure of the country, and exhibiting at their proper altitudes the different products of the vegetable kingdom. Some material is already collected for such a purpose, extending on different lines from the Mississippi to the Pacific, but not sufficient to complete the work.

The Arabic figures on different parts of the map indicate the elevation of places above the level of the sea; a knowledge of which is essential to a just conception of the climate and agricultural capacities of a country.

The longitudes established on the line of exploration of the last expedition are based on a series of astromonical observations, resting on four main positions, determined by luner culminations. The first of these main positions is at the mouth of the *Fontaine qui Bouit* river, or the Upper Arkansas; the second is on the eastern shore of the Great Salt lake, and two in the valley of the Sacramento, at the western base of the Sierra Nevada. This line

of astromonical observations, thus carried across the continent, reaches the Pacific ocean on the north shore of the bay of Monterey.

In my published map, of the year 1845, the line of the western coast was laid down according to Vancouver. When the newly established positions were placed on the map now laid before the Senate, it was found that they carried the line of the coast about fourteen miles west, and the valleys of the Sacramento and San Joaquin about twenty miles east; making an increase of more than thirty miles in the breadth of the country below the Sierra Nevada. Upon examination, it was found that these positions agreed nearly, with the observations of Captain Beechey at Monterey. The corrections required by the new positions were then accordingly made; the basin of the Sacramento and San Joaquin valleys were removed to the eastward, and the line of the coast projected farther west, conformably to my observations, retaining the configuration given to it by the surveys of Vancouver.

The error in the position of the San Joaquin, Sacramento, and Wahlahmath valleys still exists upon the most authentic maps extant; and it appears that, upon the charts in general use, a greatly erroneous position is still given to the coast.

By the return of the United States sloop-of-war Portsmouth, Commander Montgomery, from the Pacific ocean, it is learned that two British ships of war are now engaged in making a new survey of the gulf and coast of California. It is also known that an American whale ship was recently lost on the coast of California in consequence of the errors in the charts now in general use, locating the coast and islands, from Monterey south, too far east.*

* NAVAL.—The United States sloop-of-war Portsmouth, Commander John B. Montgomery, arrived at Boston on Friday, from the Pacific ocean, last from Valparaiso, February 23. Commander Montgomery states that

The astronomical observations made by me across the continent, in this my third expedition, were calculated by Professor Hubbard, of the national observatory, (Washington city,) during the present winter; and a note from him on the subject of these observations is added as an appendix to this memoir. My attention having been recently called to this subject, (the true position of the coast of California,) I find it worthy of remark, that the position given to this coast on the charts of the old Spanish navigators agrees nearly with that which would be assigned to it by the observations of the most eminent naval surveyors of the present day. The position adopted for Monterey and the adjacent coast, on the map now laid before the Senate, agrees nearly with that in which it had been placed by the observations of *Mulaspinia*,† in 1791.

In constructing this map it became necessary to adopt the coast line of the Pacific, as found in maps in general use, to give it completeness. It was no part of my design to make a chart of the coast. Finding an error when I came to lay down the Bay of Monterey, I altered my map to suit it. I knew nothing then of any errors in the coast. It is satisfactory now to find that my astronomical observations correspond with those previously made by Beechey and Belcher, and very gratifying to be able to add

the British frigate "Herald," and the brig "Pandora," are engaged in making a new survey of the gulf and coast of California.

The whale ship "Hope," of Providence, was recently lost on the coast, in consequence of an error in the charts now in general use, which locate the coasts and islands from Monterey to Cape St. Lucas from fifteen to forty miles too far to the eastward.—NATIONAL INTELLIGENCER.

+ Of this skilful, intrepid, and unfortunate navigator, Humboldt (Essay on New Spain) says:—

"The peculiar merit of his expedition consists not only in the number of astronomical observations, but principally in the judicious method which was employed to arrive at certain results. The longitude and latitude of four points on the coast (Cape San Lucas, Monterey, Nootka, and Fort Mulgrave) were fixed in an absolute manner.

some testimonial to the correctness of those made by Malaspina long before either of them. Vancouver removed the coast line as fixed by Malaspina, and the subsequent observations carry it back.

In laying this map before the Senate, and in anticipation of the full work which my explorations (with some further examinations) may enable me to draw up hereafter, I deem it a proper accompaniment to the map to present some brief notices of CALIFORNIA, with a view to show the character of the country, and its capability or otherwise to sustain a considerable population. In doing this, no general remarks applicable to the whole of California can be used. The diversity in different parts is too great to admit of generalization in the description. Separate views of different parts must be taken; and in this brief sketch, the design is to limit the view to the two great divisions of the country which lie on the opposite sides of the SIERRA NEVADA, and to the character of that mountain itself, so prominent in the structure of the country, and exercising so great an influence over the climate, soil, and productions of its two divisions.

SIERRA NEVADA.

This SIERRA is part of the great mountain range, which, under different names and different elevations, but with much uniformity of direction and general proximity of the coast, extends from the peninsula of California to Russian America, and without a gap in the distance through which the water of the Rocky mountains could reach the Pacific ocean, except at the two places where the Columbia and Frazer's river respectively find their passage. This great range is remarkable for its length, its proximity and parallelism to the sea-coast, its great elevation, often more lofty than the Rocky mountains, and its many

grand volcanic peaks, reaching high into the region of perpetual snow. Rising singly, like pyramids, from heavily timbered plateaux, to the height of fourteen and seventeen thousand feet above the level of the sea, these snowy peaks constitute the characterizing feature of the range, and distinguish it from the Rocky mountains and all others on our part of the continent.

That part of this range which traverses the ALTA CALIFORNIA is called the Sierra Nevada, (Snowy mountain)—a name in itself implying a great elevation, as it is only applied, in Spanish geography, to the mountains whose summits penetrate the region of perpetual snow. It is a grand feature of California, and a dominating one, and must be well understood before the structure of the country and the character of its different divisions can be comprehended. It divides California into two parts, and exercises a decided influence on the climate, soil, and productions of each. Stretching along the coast, and at the general distance of 150 miles from it, this great mountain wall receives the warm winds, charged with vapour, which sweep across the Pacific ocean, precipitates their accumulated moisture in fertilizing rains and snows upon its western flank, and leaves cold and dry winds to pass on the east. Hence the characteristic differences of the two regions—mildness, fertility, and a superb vegetable kingdom on one side, comparative barrenness and cold on the other.

The two sides of the Sierra exhibit two distinct climates. The state of vegetation, in connection with some thermometrical observations made during the recent exploring expedition to California, will establish and illustrate this difference. In the beginning of December, 1845, we crossed this Sierra, at latitude 39 deg. 17 min. 12 sec., at the present usual emigrant pass, at the head of the Salmon Trout river, 40 miles north of New Helvetia, and made observa-

tions at each base, and in the same latitude, to determine the respective temperatures; the two bases being, respectively, the *western* about 500, and the *eastern* about 4,000 feet above the level of the sea; and the Pass, 7,200 feet. The mean results of the observations were, on the *eastern* side, at sunrise, 9 deg.; at noon, 44 deg.; at sunset 30 deg.; the state of vegetation and the appearance of the country being at the same time (second week of December) that of confirmed winter; the rivers frozen over, snow on the ridges, annual plants dead, grass dry, and deciduous trees stripped of their foliage. At the *western* base, the mean temperature during a corresponding week was, at sunrise, 29 deg., and at sunset 52 deg.; the state of the atmosphere and of vegetation that of advancing spring; grass fresh and green, four to eight inches high, vernal plants in bloom, the air soft, and all the streams free from ice. Thus December, on one side of the mountain, was winter; on the other it was spring.

THE GREAT BASIN.

EAST of the Sierra Nevada, and between it and the Rocky mountains, is that anomalous feature in our continent, the GREAT BASIN, the existence of which was advanced as a theory after the second expedition, and is now established as a geographical fact. It is a singular feature: a basin of some five hundred miles diameter, every way, between four and five thousand feet above the level of the sea, shut in all around by mountains, with its own system of lakes and rivers, and having no connection whatever with the sea. Partly arid and sparsely inhabited, the general character of the GREAT BASIN is that of desert, but with great exceptions, there being many parts of it very fit for the residence of a civilized people; and of these parts, the Mormons have lately

established themselves in one of the largest and best. Mountain is the predominating structure of the interior of the Basin, with plains between—the mountains wooded and watered, the plains arid and sterile. The interior mountains conform to the law which governs the course of the Rocky mountains and of the Sierra Nevada, ranging nearly north and south, and present a very uniform character of abruptness, rising suddenly from a narrow base of ten to twenty miles, and attaining an elevation of two to five thousand feet above the level of the country. They are grassy and wooded, showing snow on their summit peaks during the greater part of the year, and affording small streams of water from five to fifty feet wide, which lose themselves, some in lakes, some in the dry plains, and some in the belt of alluvial soil at the base; for these mountains have very uniformly this belt of alluvion, the wash and abrasion of their sides, rich in excellent grass, fertile, and light and loose enough to absorb small streams. Between these mountains are the arid plains which receive and deserve the name of desert. Such is the general structure of the interior of the Great Basin, more Asiatic than American in its character, and much resembling the elevated region between the Caspian sea and northern Persia. The rim of this Basin is massive ranges of mountains, of which the Sierra Nevada on the west, and the Wah-satch and Timpanogos chains on the east, are the most conspicuous. On the north, it is separated from the waters of the Columbia by a branch of the Rocky mountains, and from the gulf of California, on the south, by a bed of mountainous ranges, of which the existence has been only recently determined. Snow abounds on them all; on some, in their loftier parts, the whole year, with wood and grass; with copious streams of water, sometimes amounting to consider-

able rivers, flowing inwards, and forming lakes or sinking in the sands. Belts or benches of good alluvion are usually found at their base.

Lakes in the Great Basin.—The Great Salt lake and the Utah lake are in this Basin towards its eastern rim, and constitute its most interesting feature—one, a saturated solution of common salt—the other, fresh—the Utah about one hundred feet above the level of the Salt lake, which is itself four thousand two hundred above the level of the sea, and connected by a strait, or river, thirty-five miles long.

These lakes drain an area of ten or twelve thousand square miles, and have, on the east along the base of the mountain, the usual bench of alluvion, which extends to a distance of three hundred miles, with wood and water, and abundant grass. The Mormons have established themselves on the strait between these two lakes, and will find sufficient arable land for a large settlement—important from its position as intermediate between the Mississippi valley and the Pacific ocean, and on the line of communication to California and Oregon.

The Utah is about thirty-five miles long, and is remarkable for the numerous and bold streams which it receives, coming down from the mountains on the southeast, all fresh water, although a large formation of rock salt, imbedded in red clay, is found within the area on the southeast, which it drains. The lake and its affluents afford large trout and other fish in great numbers, which constitute the food of the Utah Indians during the fishing season. The Great Salt lake has a very irregular outline, greatly extended at time of melting snows. It is about seventy miles in length; both lakes ranging nearly north and south, in conformity to the range of the mountains, and is remarkable for its predominance of salt. The whole lake waters seem thoroughly saturated with it, and every evaporation of the water leaves salt behind.

The rocky shores of the islands are whitened by the spray, which leaves salt on every thing it touches, and a covering like ice forms over the water, which the waves throw among the rocks. The shores of the lake in the dry season, when the waters recede, and especially on the south side, are whitened with incrustations of fine white salt; the shallow arms of the lake, at the same time, under a slight covering of briny water, present beds of salt for miles, resembling softened ice, into which the horses' feet sink to the fetlock. Plants and bushes, blown by the wind upon these fields, are entirely incrusted with crystallized salt, more than an inch in thickness. Upon this lake of salt the fresh water received, though great in quantity, has no perceptible effect. No fish, or animal life of any kind, is found in it; the *larvæ* on the shore being found to belong to winged insects. A geological examination of the bed and shores of this lake is of the highest interest.

Five gallons of water taken from this lake in the month of September, and roughly evaporated over a fire, gave fourteen pints of salt, a part of which being subjected to analysis, gave the following proportions:

	PARTS.
Chloride of sodium (common salt).....	97.80
Chloride of calcium.....	0.61
Chloride of magnesium.....	0.24
Sulphate of soda.....	0.23
Sulphate of lime.....	1.12
	<hr/>
	100.00

Southward from the Utah is another lake of which little more is now known than when Humboldt published his general map of Mexico. It is the reservoir of a handsome river, about two hundred miles long, rising in the Wah-satch mountains, and discharging a considerable volume of water. The river and lake were called by the Spaniards, *Severo*, corrupted by

the hunters into *Sevier*. On the map, they are called *Nicollet*, in honour of *J. N. Nicollet*, whose premature death interrupted the publication of the learned work on the physical geography of the basin of the Upper Mississippi, which five years of labour in the field had prepared him to give.

On the western side of the basin, and immediately within the first range of the Sierra Nevada, is the Pyramid Lake, receiving the water of Salmon Trout river. It is thirty-five miles long, between four and five thousand feet above the sea, surrounded by mountains, is remarkably deep and clear, and abounds with uncommonly large salmon trout. Southward, along the base of the Sierra Nevada, is a range of considerable lakes, formed by many large streams from the Sierra. Lake Walker, the largest among these, affords great numbers of trout, similar to those of the Pyramid lake, and is a place of resort for Indians in the fishing season.

There are probably other collections of water not yet known. The number of small lakes is very great, many of them more or less salty, and all, like the rivers that feed them, changing their appearance and extent under the influence of the season, rising with the melting of the snows, sinking in the dry weather, and distinctly presenting their high and low watermark. These generally afford some fertile and well-watered land, capable of settlement.

Rivers of the Great Basin.—The most considerable river in the interior of the Great Basin is the one called on the map Humboldt river, as the mountains at its head are called Humboldt river mountains—so called as a small mark of respect to the "*Nestor of scientific travellers*," who has done so much to illustrate North American geography, without leaving his name upon any one of its remarkable features. It is a river long known to hunters, and sometimes sketched on maps under the name of Mary's, or Ogden's, but

now for the first time laid down with any precision. It is a very peculiar stream, and has many characteristics of an Asiatic river—the Jordan, for example, though twice as long—rising in mountains and losing itself in a lake of its own, after a long and solitary course. It rises in two streams in mountains west of the Great Salt lake, which unite, after some fifty miles, and bears westwardly along the northern side of the basin towards the Great Sierra Nevada, which it is destined never to reach, much less to pass. The mountains in which it rises are round and handsome in their outline, capped with snow the greater part of the year, well clothed with grass and wood, and abundant in water. The stream is a narrow line, without affluents, losing by absorption and evaporation as it goes, and terminating in a marshy lake, with low shores, fringed with bulrushes, and whitened with saline incrustations. It has a moderate current, is from two to six feet deep in the dry season, and probably not fordable anywhere below the junction of the forks during the time of melting snows, when both lake and river are considerably enlarged. The country through which it passes (except its immediate valley) is a dry sandy plain, without grass, wood, or arable soil; from about 4,700 feet (at the forks) to 4,200 feet (at the lake) above the level of the sea, winding among broken ranges of mountains, and varying from a few miles to twenty in breadth. Its own immediate valley is a rich alluvion, beautifully covered with blue-grass, herd-grass, clover, and other nutritious grasses; and its course is marked through the plain by a line of willow and cotton-wood trees, serving for fuel. The Indians in the fall set fire to the grass, and destroy all trees except in low grounds near the water.

This river possesses qualities which, in the progress of events, may give it both value and fame. It lies on the line of travel to California and Oregon,

and is the best route now known through the Great Basin, and the one travelled by emigrants. It furnishes a level unobstructed way for nearly three hundred miles, and a continuous supply of the indispensable articles of water, wood, and grass. Its head is towards the Great Salt lake, and consequently towards the Mormon settlement, which must become a point in the line of emigration to California and the lower Columbia. Its termination is within fifty miles of the base of the Sierra Nevada, and opposite the Salmon Trout river pass—a pass only seven thousand two hundred feet above the level of the sea, and less than half that above the level of the Basin, and leading into the valley of the Sacramento, some forty miles north of Nueva Helvetia. These properties give to this river a prospective value in future communications with the Pacific ocean, and the profile view on the north of the map shows the elevations of the present travelling route, of which it is a part, from the South pass, in the Rocky mountains, to the bay of San Francisco.

The other principal rivers of the Great Basin are found on its circumference, collecting their waters from the Snowy mountains, which surround it, and are, 1. BEAR RIVER, on the east, rising in the massive range of the Timpanogos mountains and falling into the Great Salt lake, after a doubling course through a fertile and picturesque valley, two hundred miles long. 2. The UTAH RIVER and TIMPANOZU, or TIMPANOGOS, discharging themselves into the Utah lake on the east, after gathering their copious streams in the adjoining parts of the *Wah-satch* and Timpanogos mountains. 3. NICOLLET RIVER, rising south in the long range of the *Wah-satch* mountains, and falling into a lake of its own name, after making an arable and grassy valley, two hundred miles in length, through mountainous country. 4. SALMON TROUT river, on the west,

running down from the Sierra Nevada and falling into Pyramid lake, after a course of about one hundred miles. From its source, about one-third of its valley is through a pine-timbered country, and for the remainder of the way through very rocky, naked ridges. It is remarkable for the abundance and excellence of its salmon trout, and presents some ground for cultivation. 5. CARSON and WALKER rivers, both handsome clear-water streams, nearly one hundred miles long, coming, like the preceding, down the eastern flank of the Sierra Nevada and forming the lakes of their own name at its base. They contain salmon trout and other fish, and form some large bottoms of good land. 6. OWENS RIVER, issuing from the Sierra Nevada on the south, is a large bold stream about one hundred and twenty miles long, gathering its waters in the Sierra Nevada, flowing to the southward, and forming a lake about fifteen miles long at the base of the mountain. At a medium stage it is generally four or five feet deep, in places fifteen ; wooded with willow and cotton-wood, and makes continuous bottoms of fertile land, at intervals rendered marshy by springs and small affluents from the mountain. The water of the lake in which it terminates has an unpleasant smell and bad taste, but around its shores are found small streams of pure water with good grass. On the map this has been called OWENS river.

Besides these principal rivers issuing from the mountains on the circumference of the Great Basin, there are many others, all around, all obeying the general law of losing themselves in sands, or lakes, or belts of alluvion, and almost all of them an index to some arable land, with grass and wood.

Interior of the Great Basin.—The interior of the Great Basin, so far as explored, is found to be a succession of sharp mountain ranges and naked plains, such as have been described. These ranges are

isolated, presenting summit lines broken into many peaks, of which the highest are between ten and eleven thousand feet above the sea. They are thinly wooded with some varieties of pine, (*pinus monophyllus* characteristic,) cedar, aspen, and a few other trees ; and afford an excellent quality of bunch grass, equal to any found in the Rocky mountains. Black-tailed deer and mountain sheep are frequent in these mountains ; which, in consideration of their grass, water, and wood, and the alluvion at their base, may be called fertile, in the radical sense of the word, as signifying a capacity to produce, or bear, and in contradistinction to sterility. In this sense these interior mountains may be called fertile. Sterility, on the contrary, is the absolute characteristic of the valleys between the mountains—no wood, no water, no grass ; the gloomy artemisia the prevailing shrub—no animals, except the hares, which shelter in these shrubs, and fleet and timid antelope, always on the watch for danger, and finding no place too dry and barren which gives it a wide horizon for its view and a clear field for its flight. No birds are seen in the plains, and few on the mountains. But few Indians are found, and those in the lowest state of human existence ; living not even in communities, but in the elementary state of families, and sometimes a single individual to himself—except about the lakes stocked with fish, which become the property and resort of a small tribe. The abundance and excellence of the fish, in most of these lakes, is a characteristic ; and the fishing season is to the Indians the happy season of the year.

Climate of the Great Basin.—The climate of the Great Basin does not present the rigorous winter due to its elevation and mountainous structure. Observations made during the last expedition, show that around the southern shores of the Salt lake, latitude 40 deg. 30 min. to 41 deg., for two weeks of the

month of October, 1835, from the 13th to the 27th, the mean temperature was 40 deg. at sunrise, 70 deg. at noon, and 54 deg. at sunset; ranging at sunrise, from 28 deg. to 57 deg.; at noon, from 62 deg. to 76 deg.; at four in the afternoon, from 58 deg. to 69 deg.; and at sunset, from 47 deg. to 57 deg.

Until the middle of the month the weather remained fair and very pleasant. On the 15th, it began to rain in occasional showers, which whitened with snow the tops of the mountains on the south-eastern side of the valley. Flowers were in bloom during all the month. About the 18th, on one of the large islands in the south of the lake, *helianthus*, several species of *aster*, *erodium*, *cicutarium*, and several other plants, were in fresh and full bloom; the grass of the second growth was coming up finely, and vegetation, generally, betokened the lengthened summer of the climate.

The 16th, 17th, and 18th, stormy with rain; heavy at night; peaks of the Bear river range and tops of the mountains covered with snow. On the 18th, cleared with weather like that of late spring, and continued mild and clear until the end of the month, when the fine weather was again interrupted by a day or two of rain. No snow within 2,000 feet above the level of the valley.

Across the interior, between latitudes 11 deg. and 28 deg., during the month of November, (5th to 25th), the mean temperature was 29 deg. at sunrise, and 40 deg. at sunset; ranging at noon (by detached observations) between 41 deg. and 60 deg. There was a snow storm between the 4th and 7th, the snow falling principally at night, and sun occasionally breaking out in the day. The lower hills and valleys were covered a few inches deep with snow, which the sun carried off in a few hours after the storm was over.

The weather then continued uninterruptedly open until the close of the year, without rain or snow; and during the remainder of November, generally clear

and beautiful; nights and mornings calm, a light breeze during the day, and strong winds of very rare occurrence. Snow remained only on the peaks of the mountains.

On the western side of the basin, along the base of the *Sierra Nevada*, during two weeks, from the 25th November to the 11th December, the mean temperature at sunrise was 11 deg., and at sunset 34 deg.; ranging at sunrise from zero to 21 deg.. at sunset from 23 deg. to 44 deg. For ten consecutive days of the same period, the mean temperature at noon was 45 deg., ranging from 33 deg. to 56 deg.

The weather remained open, usually very clear, and the rivers were frozen.

The winter of 1843—44, within the basin, was remarkable for the same open, pleasant weather, rarely interrupted by rain or snow. In fact, there is nothing in the climate of this great interior region, elevated as it is, and surrounded and traversed by snowy mountains, to prevent civilized man from making it his home, and finding in its arable parts the means of a comfortable subsistence; and this the Mormons will probably soon prove in the parts about the Great Salt lake. The progress of their settlement is already great. On the 1st of April of the present year, they had 3,000 acres in wheat, seven saw and grist mills, seven hundred houses in a fortified inclosure of sixty acres, stock, and other accompaniments of a flourishing settlement.

Such is the Great Basin, heretofore characterized as a desert, and in some respects meriting that appellation; but already demanding the qualification of great exceptions, and deserving the full examination of a thorough exploration.

MARATIME REGION WEST OF THE SIERRA NEVADA.

WEST of the SIERRA NEVADA, and between that mountain and the sea, is the second grand division of California, and the only part to which the name applies in the current language of the country. It is the occupied and inhabited part—so divided by the mountain-wall of the Sierra from the Great Basin above—as to constitute a region to itself, with a structure and configuration—a soil, climate, and productions—of its own; and as northern Persia may be referred to as some type of the former, so may Italy be referred to as some point of comparison for the latter. North and south, this region embraces about ten degrees of latitude—from 32 deg., where it touches the peninsula of California, to 42 deg., where it bounds on Oregon. East and west, from the Sierra Nevada to the sea, it will average, in the middle parts, 150 miles; in the northern parts 200—giving an area of above one hundred thousand square miles. Looking westward from the summit of the Sierra, the main feature presented is the long, low, broad valley of the Joaquin and Sacramento rivers—the two valleys forming one—five hundred miles long and fifty broad, lying along the base of the Sierra, and bounded to the west by the low coast range of mountains, which separates it from the sea. Long dark lines of timber indicate the streams, and bright spots mark the intervening plains. Lateral ranges, parallel to the Sierra Nevada and the coast, make the structure of the country, and break it into a surface of valleys and mountains—the valleys a few hundred, and the mountains two to four thousand feet above the sea. These form greater masses, and become more elevated in the north, where some peaks, as the Shastl, enter

the regions of perpetual snow. Stretched along the mild coast of the Pacific, with a general elevation in its plains and valleys of only a few hundred feet above the level of the sea—and backed by the long and lofty wall of the Sierra—mildness and geniality may be assumed as the characteristic of its climate. The inhabitant of corresponding latitudes on the Atlantic side of this continent, can with difficulty conceive of the soft air and southern productions of the maritime region of Upper California. The singular beauty and purity of the sky in the south of this region is characterised by Humboldt as a rare phenomenon, and all travellers realise the truth of his description.

The present condition of the country affords but slight data for forming correct opinions of the agricultural capacity and fertility of the soil. Vancouver found, at the mission of San Buenaventura, in 1792, latitude 34 deg. 16 min., apples, pears, plums, figs, oranges, grapes, peaches, and pomegranates, growing together with the plaintain, banana, cocoa-nut, sugar-cane, and indigo, all yielding fruit in abundance, and of excellent quality. Humboldt mentions the olive oil of California as equal to that of Andalusia, and the wine like that of the Canary Islands. At present, but little remains of the high and various cultivation which had been attained at the missions.—Under the mild and paternal administration of the "Fathers," the docile character of the Indians was made available for labour, and thousands were employed in the fields, the orchards, and the vineyards. At present, but little of this former cultivation is seen. The fertile valleys are overgrown with wild mustard; vineyards and olive orchards, decayed and neglected, are among the remaining vestiges; only in some places do we see the evidences of what the country is capable. At San Buenaventura, we found the olive trees, in January, bending under the weight

of neglected fruit; and the mission of San Luis Obispo (latitude 35 deg.) is still distinguished for the excellence of its olives, considered finer and larger than those of the Mediterranean.

The productions of the south differ from those of the north and the middle. Grapes, olives, Indian corn, have been its staples, with many assimilated fruits and grains. Tobacco has been recently introduced, and the uniform summer heat which follows the wet season, and is uninterrupted by rain, would make the southern country well adapted to cotton.—Wheat is the first product of the north, where it always constituted the principal cultivation of the missions. This promises to be the grain-growing region of California. The moisture of the coast seems peculiarly suited to the potato, and to the vegetables of the United States, which grow to an extraordinary size.

Perhaps few parts of the world can produce in such perfection so great a variety of fruits and grains as the large and various region inclosing the bay of San Francisco, and drained by its waters. A view of the map will show that region and its great extent, comprehending the entire valleys of the Sacramento and San Joaquin, and the whole western slope of the Sierra Nevada. General phrases fail to give precise ideas, and I have recourse to the notes in my journey to show its climate and productions by the test of the thermometer, and the state of the vegetable kingdom.

VALLEYS OF THE SACRAMENTO AND SAN JOAQUIN.

These valleys are one, discriminated only by the names of the rivers which traverse it. It is a single valley—a single geographical formation, near 500 miles long, lying at the western base of the Sierra

Nevada, and between it and the coast range of mountains, and stretching across the head of the bay of San Francisco, with which a *delta* of twenty-five miles connects it. The two rivers, San Joaquin and Sacramento, rise at the opposite ends of this long valley, receive numerous streams, many of them bold rivers, from the Sierra Nevada, become themselves navigable rivers, flow towards each other, meet half-way, and enter the bay of San Francisco together, in the region of tide-water, making a continuous water-line from one end to the other.

The valley of the San Joaquin is about 300 miles long and 60 broad, between the slopes of the coast mountain and the Sierra Nevada, with a general elevation of only a few hundred feet above the level of the sea. It presents a variety of soil, from dry and unproductive to well watered and luxuriantly fertile. The eastern (which is the fertile) side of the valley is intersected with numerous streams, forming large and beautiful bottoms of fertile land, wooded principally with white oaks (*quercus longiglanda*, Torr. and Frem.) in open groves of handsome trees, often five or six feet in diameter, and sixty to eighty feet high. Only the larger streams, which are fifty to one hundred and fifty yards wide, and drain the upper parts of the mountains, pass entirely across the valley, forming the *Tularé* lakes and the San Joaquin river, which, in the rainy season, make a continuous stream from the head of the valley to the bay. The *foot hills* of the Sierra Nevada, which limit the valley, make a woodland country, diversified with undulating grounds and pretty valleys, and watered with numerous small streams, which reach only a few miles beyond the hills, the springs which supply them not being copious enough to carry them across the plains. These afford many advantageous spots for farms, making sometimes large bottoms of rich moist land. The rolling surface of the hills presents sunny expo-

sures, sheltered from the winds, and having a highly favourable climate and suitable soil, are considered to be well adapted to the cultivation of the grape, and will probably become the principal vine growing region of California. The uplands bordering the valleys of the large streams are usually wooded with evergreen oaks, and the intervening plains are timbered with groves or belts of evergreen and white oaks, among prairie and open land. The surface of the valley consists of level plains along the Tulare lakes and San Joaquin river, changing into undulating and rolling ground nearer the foot hills of the mountains.

A condensed notice from observations, made during several journeys through the valley, will serve to give some definite ideas of its climate and character.

We left the upper settlements of New Helvetia on the 14th December, and, passing through the groves of oak which border the Rio de los Americanos, directed our course in a south-easterly direction across a plain toward the Rio de los Cos-um-nes, a handsome, well-wooded stream, about thirty yards wide. The Cos-um-ne Indians, who give name to this river, have been driven away from it within a few years, and dispersed among other tribes; and several farms, of some leagues in extent, have already been established on the lower part of the stream. We encamped at one of these, about eight miles above the junction of Cos-um-ne river with the Mo-kel-um-ne, which a few miles below enters a deep slough in the tide-water of the San Joaquin delta.

At this place the temperature at sunset was 55 deg., and at sunrise 27 deg.

Our road on the 15th was over the plain between the Cos-um-ne and Mo-kel-um-ne rivers, inclining toward the mountains. We crossed several wooded

sloughs, with ponds of deep water, which, nearer the foot hills, are running streams, with large bottoms of fertile land ; the greater part of our way being through open woods of evergreen and other oaks. The rainy season, which commonly begins with November, had not yet commenced, and the Mo-kel-um-ne river was at the lowest stage usual to the dry season, and easily forded. This stream is about sixty yards wide, and the immediate valley some thirty or forty feet below the upland plain. It has broad alluvial bottoms of very fertile soil—sometimes five hundred yards wide, bounded by a low upland, wooded with evergreen oaks. The weather in the evening was calm, the sky mottled with clouds, and the temperature at sunset 52 deg.

Leaving the Mo-kel-um-ne, (December 16,) we travelled about twenty miles through open woods of white oak, crossing in the way several stream beds—among them the Calaveras creek. These have abundant water, with good land above; and the Calaveras makes some remarkably handsome bottoms. Issuing from the woods, we rode about sixteen miles over an open prairie, partly covered with bunch-grass, the timber reappearing on the rolling hills of the river Stanislaus in the usual belt of evergreen oaks. The river valley was about forty feet below the upland, and the stream seventy yards broad, making the usual fertile bottoms, which were covered with green grass among large oaks. We encamped in one of these bottoms, in a grove of the large white oaks previously mentioned, as *quercus longiglinda* (*Torr. and Frem.*) This oak is a new species, belonging to the division of the white oaks, distinguished by the length of its acorn, which is commonly an inch and a half, and sometimes two inches. This long acorn characterizes the tree, which has accordingly been specified by Dr. Torrey as *quercus longiglinda*—(long-

acorn oak.*). The tree attains frequently a diameter of six feet, and a height of eighty feet, with a wide spreading head. The many varieties of deciduous and evergreen oaks, which predominate throughout the valleys and lower hills of the mountains, afford large quantities of acorns, which constitute the principal food of the Indians of that region. Their great abundance, in the midst of fine pasture lands, must make them an important element in the agricultural economy of the country.

The day had been very warm, and at sunset the temperature was 55 deg., and the weather clear and calm.

At sunrise next morning, the thermometer was at 22 deg., with a light wind from the Sierra, N. 75 deg. E., and a clear, pure sky, in which the blue line of the mountain showed distinctly. The way, for about three miles, was through open woods of evergreen and other oaks, with some shrubbery intermingled. Among this was a *lupinus* of extraordinary size, not yet in bloom. Emerging from the woods, we travelled in a southeasterly direction, over a prairie of rolling land, the ground becoming somewhat more broken as we approached the To-wal-um-ne river, one of the finest tributaries of the San Joaquin. The hills were generally covered with a species of geranium, (*erodium cicutarium*,) a valuable plant for stock, considered very nutritious. With this was frequently interspersed good and green bunch-grass, and a plant commonly called bur clover. This plant, which in some places is very abundant, bears a spirally twisted pod, filled with seeds, which remains on the ground during the dry season, well preserved, and affords good food for cattle until the spring rains bring out new grass. We started a band of wild horses on approaching the

* The names of plants mentioned in this memoir rest on the authority of Dr. Torrey, by whom the specimens have been examined.

river, and the Indians ran off from a village on the bank—the men lurking round to observe us. About their huts were the usual *acorn cribs*, containing each some twenty or thirty bushels. We found here excellent grass, and broad bottoms of alluvial land, open-wooded, with large white oaks of the new species. The thermometer, at sunset, was 54.5 deg., with a calm, clear atmosphere. Multitudes of geese and other wild fowl made the night noisy.

In the morning, the sky was clear, with an air from S. 55 E., and a hoar frost covering the ground like a light fall of snow. At sunrise, the thermometer was 24.5 deg. Our course now inclined more towards the foot of the mountain, and led over a broken country. In about 17 miles we reached the river Aux-uni-ne, another large affluent to the San Joaquin, and continued about six miles up the stream, intending to reach gradually, the heart of the mountains at the head of the Lake Fork of the Tulare.

We encamped on the southern side of the river, where broken hills made a steep bluff, with a narrow bottom. On the northern side was a low, undulating wood and prairie land, over which a band of about three hundred elk, was slowly coming to water where we halted, feeding as they approached.

Dec. 19th.—The weather continued clear and pleasant. We continued our journey in a southeasterly direction, over a broken and hilly country, without timber, and showing only scattered clumps of trees, from which we occasionally started deer. In a few hours' ride we reached a beautiful country of undulating upland, openly timbered with oaks, principally evergreen, and watered with small streams. We came here among some villages of Indians, of the horse-thief tribes, who received us in an unfriendly manner; and after a busy night among them, we retreated the next morning to the more open country of the lower hills. Our party was then a small one of

16 men, encumbered with cattle, which we were driving to the relief of the main body of the expedition, which had been sent southward from Walker's lake, in the basin, along the eastern base of the Sierra Nevada, and to which a valley in the mountain, on the Tulare Lake Fork, had been appointed as a place of meeting.

In the evening, we encamped at an elevation of 1000 feet above the sea, latitude 37 deg. 07 min. 47 sec., still among the hills, on a spring hollow, leading to the Upper Joaquin river. The day had been mild, with a faint sun, and cloudy weather; and, at sunset, there were some light clouds in the sky, with a north-easterly wind, and a sunset temperature of 45 deg.; probably rendered lower than usual by the air from the mountains, as the foot-hills have generally a warmer temperature than the open valley. Elk were numerous during the day, making, on one occasion, a broken band, several miles in length.

On the 21st, the thermometer at sunrise was 32.6; the sky slightly clouded, and, in the course of the morning, the clouds gathered heavy in the southwest. Our route lay in a south-easterly direction, toward the Upper Joaquin, crossing among rolling hills, a large stream and several sandy beds of affluents to the main river. On the trees along these streams, as well as on the hills, I noticed *mosses*. About 2, in the afternoon, we reached the Upper San Joaquin. The stream was 70 yards wide, and much too deep to be forded. A little way below, we succeeded in crossing, at a rapid made by a bed of rock, below which, for several miles, the river appeared deep and not fordable. We followed down the stream for six or eight miles, and encamped on its banks, on the verge of the valley plain. At evening, rain began to fall, and, with this, the spring properly commenced. There had been a little rain in November, but not sufficient to revive vegetation.

December 22.—The temperature at sunrise was 39 deg. There had been heavy rain during the night, with high wind, and this morning, there was a thick fog, which began to go off at 8 o'clock, when the sun broke through. We crossed an open plain, still in a south-easterly direction, reaching, in about twenty miles, the *Tulares Lake* river. This is one of the largest and handsomest streams in the valley, being about 100 yards broad, and having, perhaps, a larger body of fertile land than any other. The broad alluvial bottoms are well wooded with several species of oaks. This is the principal affluent to the Tulare lake, (the bullrush lake,) a strip of water, about 70 miles long, surrounded by lowlands, rankly overgrown with bullrushes, and receiving all the rivers in the southern end of the valley. In times of high water, the lake discharges into the Joaquin, making a continuous water-line through the whole extent of the valley.

We ascended this river to its sources in the Sierra Nevada, about 50 miles from the edge of the valley, which we reached again on the 7th of January, in the neighbourhood of the Tulare lake. We found the temperature as in December. Fogs, which rose from the lake in the morning, were dense, cold, and penetrating, but, after a few hours, gave place to a fine day. The face of the country had been much improved by the rains which had fallen while we remained in the mountains. Several humble plants, among them the golden-flowered violet, (*viola crysanthia*) and *erodium cicutarium*, the first valley flowers of the spring, which courted a sunny exposure and warm sandy soil, were already in bloom on the south-western hill-slopes. In the foot hills of the mountains the bloom of the flowers was earlier. We travelled among multitudinous herds of elk, antelope, and wild horses. Several of the latter, which we killed for food, were found to be very fat.

By the middle of January, when we had reached the lower San Joaquin, the new green grass covered the ground among the open timber on the rich river bottoms, and the spring vegetation had taken a vigorous start.

The mean temperature in the Joaquin valley, during the journey, from the middle of December to the middle of January, was at sunrise 29 deg. and at sunset 52 deg., with generally a faint breeze from the snowy mountains in the morning, and calm weather in the evening. This was a lower temperature than we had found in the oak region of the mountains bordering the valley, between 1000 and 5000 feet above the level of the sea, where, throughout California, I have remarked the spring to be more forward than in the open valleys below.

During a journey through the valley, between the head of the Tulare lakes and the mouth of the San Joaquin, from the 19th January to the 12th February, the mean temperature was 38 deg. at sunrise and 53 deg. at sunset, with frequent rains. At the end of January, the river bottoms, in many places, were thickly covered with luxuriant grass, more than half a foot high. The California poppy, (*Eschscholtzia Californica*,) the characteristic plant of the California spring; *memophila insignis*, one of the earliest flowers, growing in beautiful fields of a delicate blue, and *orodium cicutarium*, were beginning to show a scattered bloom. Wild horses were fat, and a grisly bear, killed on the 2nd February, had four inches thickness of fat on his back and belly, and was estimated to weigh a thousand pounds. Salmon was first obtained on the 4th February in the To-wal-um-ne river, which, according to the Indians, is the most southerly stream in the valley in which this fish is found. By the middle of March, the whole valley of the San Joaquin was in the full glory of spring; the evergreen oaks were in flower, *geranium cicutarium* was generally

in bloom, occupying the place of the grass, and making on all the uplands a close *sward*. The higher prairies between the rivers presented unbroken fields of yellow and orange-coloured flowers, varieties of *Layia* and *Eschscholtzia Californica*, and large bouquets of the blue flowering *nemophila* nearer the streams. These made the prevailing bloom, and the sunny hill-slopes to the river bottoms showed a varied growth of luxuriant flowers. The white oaks were not yet in bloom.

Observations made in the valley, from the bend of the Joaquin to the Cos-um-ne river, give, for the mean temperature, from the 10th to the 22nd March, 38 deg. at sunrise and 56 deg. at sunset, the dew point being 35.7 deg. at sunrise, and 47.6 deg. at sunset, and the quantity of moisture contained in a cubic foot of air being 2.712 grains, and 4.072 grains, respectively.

A sudden change in the temperature was remarked in passing from the To-wal-um-ne to the Stanislaus river, there being no change in the weather, and the wind continuing from the north-west, to which we were more directly exposed on reaching the Stanislaus river, where we opened on the bay. In travelling down to the Stanislaus, the mean temperature for five days (from the 11th to the 16) was 40.3 deg. at sunrise, 73 deg. at 4 p. m., and 63 deg. at sunset; and detached observations gave 66 deg. at 9 a. m., 77 deg. at noon, and 87 deg. at 2 p. m.

The dew point was 38.0 deg., 55.5 deg., 54.3 deg. at sunrise, at 4 in the afternoon, and at sunset; and the moisture contained in a cubic foot of air 2.878 grains, 5.209 grains, and 4.927 grains, respectively.

North of the Stanislaus for five days (from 16th to the 21st) the mean was 36.6 deg. at sunrise, 57 deg. at 4 p. m., and 49 deg. at sunset. The dew point was 34.9 deg. at sunrise, 37.1 deg. at 4 p. m., and 40.9 deg. at sunset, and the quantity of moisture

in a cubic foot of air 2.671 grains, 2.983 grains, and 3.216 grains, at the corresponding times. At sunrise of the 16th, on the To-wal-um-ne, the thermometer was at 43 deg., and at sunrise of the next morning, on the Stanislaus, at 35 deg.

The temperature was lowest on the night of the 17th. At sunrise of the morning following, the thermometer was at 27 deg., and it was remarked that the frost affected several varieties of plants. On the 20th and 21st there were some showers of rain, the first since the end of February. These were preceded by south-westerly winds.

During December and the first part of January, which was still at the season of low waters, we were easily able to ford all the Joaquin tributaries. These begin to rise with the rains, and are kept up by the melting snows in the summer. At the end of January, the Joaquin required boating throughout the valley, and the tributaries were forded with difficulty.

In the latter part of March, of a dry season, (1844,) we were obliged to boat the Stanislaus, To-wal-um-ne, and Aux-um-ne, and the San Joaquin was nowhere fordable below the bend where it is joined by the slough of the Tulare lake. On the 13th of March, 1846, we were obliged to boat the San Joaquin, the river being nowhere fordable below the junction of the slough, and the Indians guided us to some difficult fords of the large tributaries, where we succeeded to cross with damage to our equipage. In July of the same year, we boated the San Joaquin below the Aux-um-ne, it being nowhere fordable below the bend.

In June, 1847, the Joaquin was nowhere fordable, being several hundred yards broad as high up as the Aux-um-ne river, even with its banks, and scattered in sloughs over all its lower bottoms. All the large tributaries, the Auz-um-ne, To-wal-um-ne, Stanis-

laus, and Mo-kel-um-ne, required to be boated, and were pouring down a deep volume of water from the mountains, one to two hundred yards wide. The high waters came from the melting snows, which during the past winter, had accumulated to a great depth in the mountains, and, at the end of June, lay in the approaches to the Bear river pass, on a breadth of ten or fifteen miles, and this below the level of 7,200 feet. In rainy seasons, when the rains begin with November, and the snows lie on the mountains till July, this river is navigable for eight months of the year—the length of time depending on the season.

The Cos-um-ne was the last tributary of the San Joaquin, and the last river of its valley coming down from the Sierra Nevada. The Rio de los Americanos was the first tributary of the valley of the Sacramento, also coming down, like all the respectable tributaries of both rivers, from the snowy summit and rainy side of the great Sierra. The two valleys are *one*, only discriminated in description or reference by the name of the river which traverses the respective halves, as seen in the map. We entered the part of the valley which takes the name of its river, Sacramento, on the 21st day of March, going north, and continued our observations on that valley.

We remained several days on the Rio de los Americanos, to recruit our animals on the abundant range between the Sacramento and the hills. During this time the thermometer was at 35 deg. at sunrise, 54 deg. at 9 o'clock in the morning, 63 deg. at noon, 63 deg. at 2 in the afternoon, 61 deg. at 4, and 53 deg. at sunset; the dew-point at corresponding times being 34.0 deg., 49.9 deg., 46.6 deg., 49.4 deg., 51.6 deg., 43.7 deg.; and the quantity of moisture in a cubic foot of air being 2.519 grs.,

4.235 grs., 3.808 grs., 4.161 grs., 4.484 grs.,
3.469 grs.

We left the Rio de los Americanos on the 24th, ten miles above the mouth, travelling a little east of north, in the direction of the Bear river settlements, at the foot of the Emigrant pass. The road led among oak timber, over ground slightly undulating, covered with grass intermingled with flowers. The thermometer at 4 was 76 deg., and at sunset 60 deg.; the weather clear.

At sunrise of the 25th, the temperature was 36 deg., with an easterly wind and clear sky. In about thirty miles travel to the north, we reached the rancho of Mr. Keyser, on Bear river; an affluent to Feather river, the largest tributary of the Sacramento. The route lay over an undulating country—more so as our course brought us nearer the mountains—wooded with oaks and shrubbery in blossom, with small prairies intervening. Many plants were in flower, and among them the California poppy, unusually magnificent. It is the characteristic bloom of California at this season, and the Bear river bottoms, near the hills, were covered with it. We crossed several small streams, and found the ground miry from the recent rains. The temperature at 4 in the afternoon was 70 deg., and at sunset 58 deg., with an easterly wind, and the night bright and clear.

The morning of the 25th was clear, and warmer than usual; the wind south-easterly, and the temperature 40 deg. We travelled across the valley plain, and in about sixteen miles reached Feather River, at twenty-six miles from its junction with the Sacramento, near the mouth of the Yuva, so called from a village of Indians who live on it. The river has high banks,—twenty or thirty feet, and was here one hundred and fifty yards wide, a deep, navigable stream. The Indians aided us across the river, with canoes and small rafts. Extending along the bank in

front of the village, was a range of wicker cribs, about twelve feet high, partly filled with what is there the Indians' staff of life—acorns. A collection of huts, shaped like bee-hives, with naked Indians sunning themselves on the tops, and these acorn cribs, are the prominent objects in an Indian village.

There is a fine farm, or rancho, on the Yuva, stocked with about 3,000 head of cattle, and cultivated principally in wheat, with some other grains and vegetables, which are carried, by means of the river, to a market at San Francisco. Mr. Cordua, a native of Germany, who is proprietor of the place, informed me that his average harvest of wheat was about twenty-five bushels to the acre, which he supposed would be about the product of the wheat lands in the Sacramento valley. The labour on this and other farms in the valley is performed by Indians.

The temperature here was 74 deg. at two in the afternoon, 71 deg. at four, and 69 deg. at sunset, with a north-easterly wind and clear sky.

At sunrise of the 27th, the temperature was 42 deg, clear, with a north-easterly wind. We travelled northwardly, up the right bank of the river, which was wooded with large white and evergreen oaks, interspersed with thickets of shrubbery in full bloom. We made a pleasant journey of twenty-seven miles, and encamped at the bend of the river, where it turns from the course across the valley to run southerly to its junction with the Sacramento. The thermometer at sunset was at 67 degrees, sky partially clouded, with southerly wind.

The thermometer at sunrise on the 28th, was at 46.5 deg., with a north-easterly wind. The road was over an open plain, with a few small sloughs or creeks that do not reach the river. After travelling about fifteen miles, we encamped on Butte creek, a beautiful stream of clear water, about fifty yards wide, with a bold current running all the year.

It has large fertile bottoms, wooded with open groves, and having a luxuriant growth of pea-vine among the grass. The oaks here were getting into general bloom. Fine ranchos have been selected on both sides the stream, and stocked with cattle, some of which were now very fat. A rancho here is owned by Neale, who formerly belonged to my exploring party. There is a rancheira (Indian village) near by, and some of the Indians gladly ran races for the head and offals of a fat cow which had been presented to us. They were *entirely* naked. The thermometer at two in the afternoon was 70 deg., two hours later at 74 deg., and 65 deg. at sunset: the wind east, and the sky clear only in the west.

The temperature at sunrise of the next day was 50 deg., with cumuli in the south and west, which left a clear sky at 9, with a north-west wind, and temperature of 64 deg. We travelled 20 miles, and encamped on Pine creek, another fine stream, with bottoms of fertile land, wooded with groves of large and handsome oaks, some attaining to six feet in diameter, and forty to seventy feet in height. At 4 in the afternoon the thermometer showed 74 deg. and 64 deg. at sunset; and the sky clear, except in the horizon.

March 30.—The sun rose in masses of clouds over the eastern mountains. A pleasant morning, with a sunrise temperature of 46.5 deg. and some mosquitos—never seen, as is said, in the coast country; but at season of high water abundant and venomous in the bottoms of the Joaquin and Sacramento. On the tributaries nearer the mountain but few are seen, and these go with the sun. Continuing up the valley, we crossed in a short distance a large wooded creek, having now about thirty-five feet breadth of water. Our road was over an upland prairie of the Sacramento, having a yellowish, gravelly soil, generally two or three miles from the river, and twelve or

fifteen from the foot of the eastern mountains. On the west it was 25 or 30 miles to the foot of the mountains, which here make a bed of high and broken ranges. In the afternoon, about half a mile above its mouth, we encamped on Deer creek, another of these beautiful tributaries to the Sacramento. It has the usual broad and fertile bottom lands common to these streams, wooded with groves of oak and a large sycamore (*platanus occidentalis*), distinguished by bearing its balls in strings of three to five, and peculiar to California. Mr. Lassen, a native of Germany, has established a rancho here, which he has stocked, and is gradually bringing into cultivation. Wheat, as generally throughout the north country, gives large returns; cotton, planted in the way of experiment, was not injured by frost, and succeeded well: and he has lately planted a vineyard, for which the Sacramento valley is considered to be singularly well adapted. The seasons are not yet sufficiently understood, and too little has been done in agriculture, to afford certain knowledge of the capacities of the country. This farm is in the 40th degree of latitude; our position on the river being in 30 deg. 57 min. 00 sec., and longitude 121 deg. 56 min. 44 sec. west from Greenwich, and elevation above the sea 560 feet. About three miles above the mouth of this stream are the first rapids—the present head of navigation—in the Sacramento river, which, from the rapids to its mouth in the bay, is more than 200 miles long, and increasing in breadth from 150 yards to 600 yards in the lower part of its course.

During six days that we remained here, from the 30th of March to the 5th of April, the mean temperature was 40 deg. at sunrise, 52.5 deg. at 9 in the morning, 57.2 deg. at noon, 59.4 deg. at 2 in the afternoon, 58.8 deg. at 4, and 52. deg. at sunset; at the corresponding times the dew point was at 37.0 deg., 41.0 deg., 38.1 deg., 39.6 deg., 44.9 deg.,

40.5 deg.; and the moisture in a cubic foot of air 2.838 grs., 3.179 grs., 2.935 grs., 3.034 grs., 3.766 grs., 3.150 grs., respectively. Much cloudy weather and some showers of rain, during this interval, considerably reduced the temperature, which rose with fine weather on the 5th. Salmon was now abundant in the Sacramento. Those which we obtained were generally between three and four feet in length, and appeared to be of two distinct kinds. It is said that as many as four different kinds ascend the river at different periods. The great abundance in which this fish is found gives it an important place among the resources of the country. The salmon crowd in immense numbers up the Umpqua, Tlamath, and Trinity rivers, and into every little river and creek on the coast north of the Bay of San Francisco, ascending the river Tlamath to the lake near its source, which is upwards of 4,000 feet above the sea, and distant from it only about 200 miles.

In the evening of the 5th we resumed our journey northward, and encamped on a little creek, near the Sacramento, where an emigrant from "the States" was establishing himself, and had already built a house. It is a handsome place, wooded with groves of oak, and along the creek are sycamore, ash, cotton-wood, and willow. The day was fine, with a north-east wind.

The temperature at sunrise the next day (April 6th), was 42 deg., with a north-easterly wind. We continued up the Sacramento, which we crossed in canoes at a farm on the right bank of the river. The Sacramento was here about 140 yards wide, and with the actual stage of water, which I was informed continued several months, navigable for a steamboat. We encamped a few miles above, on a creek wooded principally with large oaks. Grass was good and abundant, with wild oats and pea-vine in the bottoms. The day was fine, with a cool north-westerly breeze,

which had in it the air of the high mountains. The wild oats here were not yet headed.

The snowy *Peak of Shastl* bore directly north, showing out high above the other mountains. Temperature at sunset 57 deg., with a west wind and sky partly clouded.

April 7.—The temperature at sunrise was 37 deg., with a moist air; and a faintly clouded sky indicated that the wind was southerly along the coast. We travelled towards the Shastl peak, the mountain ranges, on both sides of the valleys, being high and rugged, and snow-covered. Some remarkable peaks in the Sierra, to the eastward, are called the *Sisters*, and, nearly opposite, the Coast Range shows a prominent peak, which we have called Mount Linn.

Leaving the Sacramento, at a stream called *Red Bank Creek*, and continuing to the head of one of its forks, we entered on a high and somewhat broken upland, timbered with at least four varieties of oaks, with *mansanita* (*arbutus Menziesii*) and other shrubbery interspersed. A remarkable species of pine, having leaves in threes, (sometimes six to nine inches long,) with bluish foliage, and a spreading, oak-shaped top, was scattered through the timber. I have remarked that this tree grows lower down the mountains than the other pines, being found familiarly associated with the oaks, the first met after leaving the open valleys, and seeming to like a warm climate. Flowers were as usual abundant. The splendid California poppy characterized all the route along the valley. A species of clover was in bloom, and the berries of the *mansanita* were beginning to redden on some trees, while on others they were still in bloom. We encamped, at an elevation of about 1,000 feet above the sea, on a large stream called Cottonwood creek, wooded on the bottoms with oaks, and with cottonwoods along the bed, which is sandy and gravelly. The water was at this time about twenty yards wide,

but is frequently fifty. The face of the country traversed during the day was gravelly, and the bottoms of the creek where we encamped have a sandy soil.

There are six or seven *rancherias* of Indians on the Sacramento river between the farm where we had crossed the Sacramento and the mouth of this creek, and many others in the mountains about the heads of these streams.

The next morning was cloudy, threatening rain, but the sky grew brighter as the sun rose, and a southerly wind changed to north-west, which brought, as it never fails to bring, clear weather.

We continued 16 miles up the valley, and encamped on the Sacramento river. In the afternoon (April 8) the weather again grew thick, and in the evening rain began to fall in the valley and snow on the mountains. We were now near the head of the lower valley, and the face of the country and the weather began sensibly to show the influence of the rugged mountains which surround and terminate it.

The valley of the Sacramento is divided into upper and lower—the lower two hundred miles long, the upper about one hundred; and the latter not merely entitled to the distinction of upper, as being higher up on the river, but also as having a superior elevation of some thousands of feet above it. The division is strongly and geographically marked. The Shastl peak stands at the head of the lower valley, in the forks of the river, rising from a base of about 1,000 feet out of a forest of heavy timber. It ascends like an immense column upwards of 14,000 feet, (nearly the height of Mont Blanc,) the summit glistening with snow, and visible, from favourable points of view, at a distance of 140 miles down the valley. The river here, in descending from the upper valley, plunges down through a *canon*, falling 2,000 feet in twenty miles. This upper valley is 100 miles long, heavily timbered, the climate and productions modified by its

altitude, its more northern position, and the proximity and elevation of the neighbouring mountains covered with snow. It contains valleys of arable land, and is deemed capable of settlement. Added to the lower valley, it makes the whole valley of the Sacramento 300 miles long.

April 9.—At 10 o'clock the rain which commenced the previous evening had ceased, and the clouds clearing away, we boated the river, and continued our journey eastward toward the foot of the Sierra. The Sacramento bottoms here are broad and prettily wooded, with soil of a sandy character. Our way led through very handsome, open woods, principally of oaks, mingled with a considerable quantity of the oak-shaped pine. Interspersed among these were bouquets or thickets of mansanita, and an abundant white-flowering shrub, now entirely covered with small blossoms. The head of the valley here (lower valley) is watered by many small streams, having fertile bottom lands, with a good range of grass and acorns. In about six miles we crossed a creek 20 or 25 feet wide, and several miles farther descended into the broad bottoms of a swift stream about 20 yards wide, called Cow creek, so named as being the range of a small band of cattle, which ran off here from a party on their way to Oregon. They are entirely wild, and are hunted like other game. A large band of antelope was seen in the timber, and five or six deer came darting through the woods. An antelope and several deer were killed. There appear to be two species of these deer—both of the kind generally called black-tailed; one, a larger species frequenting the prairies and lower grounds; the other, much smaller, and found in the mountains only. The mountains in the north-east were black with clouds when we reached the creek, and very soon a fierce hail storm burst down on us, scattering our animals and covering the ground an inch in depth with hail-

stones about the size of wild cherries. The face of the country appeared as whitened by a fall of snow, and the weather became unpleasantly cold. The evening closed in with rain, and thunder rolling around the hills. Our elevation here was between 1,000 and 1,100 feet. At sunrise the next morning the thermometer was at 33 deg. The surrounding mountains showed a continuous line of snow, and the high peaks looked wintry. Turning to the southward, we retraced our steps down the valley, and reached Mr. Lassen's, on Deer river, on the evening of the 11th. The Sacramento bottoms between Antelope and Deer river were covered with oats, which had attained their full height, growing as in sown fields. The country here exhibited the maturity of spring. The California poppy was every where forming seed pods, and many plants were in flower and seed together. Some varieties of clover were just beginning to bloom. By the middle of the month the seed vessels of the California poppy, which, from its characteristic abundance, is a prominent feature in the vegetation, had attained their full size; but the seeds of this and many other plants, although fully formed, were still green coloured, and not entirely ripe. At this time I obtained from the San Joaquin valley seeds of the poppy, and other plants, black and fully ripe, while they still remained green in this part of the Sacramento—the effect of a warmer climate in the valley of the San Joaquin. The mean temperature for 14 days, from the 10th to the 24th of April, was 43 deg. at sunrise, 58 deg. at 9 in the morning, 64 deg. at noon, 66 deg. at 2 in the afternoon, 69 deg. at 4, and 58 deg. at sunset, (latitude 40 deg.) The thermometer ranged at sunset from 38 deg. to 51 deg. at 4 (which is the hottest of those hours of the day when the temperature was noted) from 53 deg. to 88 deg., and at sunset from 49 deg. to 65 deg. The dew point was 40.3 deg.

at sunrise, 47.3 deg. at 9 in the morning, 46.1 deg. at noon, 49.2 deg. at 2 in the afternoon, 49.2 deg. at 4, and 46.6 deg. at sunset; and the quantity of moisture in a cubic foot of air at corresponding times was 3.104 grs., 3.882 grs., 3.807 grs., 4.213 grs., 4.217 grs., 3.884 grs., respectively. The winds fluctuated between north-west and south-east, the temperature depending more upon the state of the sky than the direction of the winds—a clouded sky always lowering the thermometer fifteen or twenty degrees in a short time. For the greater number of the days above given, the sky was covered and the atmosphere frequently thick, with rain at intervals from the 19th to the 23rd.

On the 25th of May, we returned to this place (Lassen's) from an excursion to the Upper Sacramento. The plants we had left in bloom were now generally in seed; and many, including the characteristic plants, perfectly ripe. The mean temperature of a few days ending May, was 54.7 deg. at sunrise, 70.6 deg. at noon, and 67.3 at sunset. Travelling south into the more open and wider part of the valley, where the bordering mountains are lower and showed less snow, the temperature increased rapidly. At the *Buttes*—an isolated mountain ridge about six miles long and about 2,690 feet above the sea—the mornings were pleasantly cool for a few hours, but before ten the heat of the sun became very great, though usually tempered by a refreshing breeze. The heat was usually the greatest about four in the afternoon. The mean temperature from May 27th to June 6th, was 64 deg. at sunrise, 79 deg. at nine in the morning, 86 deg. at noon, 90 deg. at two in the afternoon, 91 deg. at four, and 80 deg. at sunset, ranging from 53 deg. to 79 deg. at sunrise—from 85 deg. to 98 deg. at four in the afternoon—and from 73 deg. to 89 deg. at sunset. The place of observation was at the eastern base of the *Buttes*, about

800 feet above the sea, latitude 39 deg. 12 min., and one of the warmest situations in the Sacramento valley. At corresponding times the dew point was at 56.5 deg., 62.4 deg., 66.5 deg., 68.2 deg., 66.6 deg., 66.9 deg., and the quantity of moisture in a cubic foot of air 5.253 grs., 6,318 grs., 7.191 grs., 7.495 grs., 7.164 grs., and 7.269 grs. respectively. We felt the heat here more sensibly than at any other place where our journeying brought us in California. The hunters always left the camp before daylight, and were in by nine o'clock, after which the sun grew hot. Game was very fat and abundant: upwards of eighty deer, elk, and bear were killed in one morning. The range consisted of excellent grasses, wild oats in fields, red and other varieties of clover, some of which were now in mature seed and others beginning to flower. Oats were now drying in level places where exposed to the full influence of the sun, remaining green in moister places and on the hill slopes.

The mean temperature of the open valley between the Buttes and the American fork from the 8th to the 21st June, was 67 deg. at sunrise, 74 deg. at nine in the morning, 85 deg. at noon, 87 deg. at two in the afternoon, 88 deg. at four, and 77 deg. at sunset; ranging at sunrise from 51 deg. to 61 deg.; at 4 from 81 deg. to 97 deg., and at sunset from 71 deg. to 85 deg. The dew point at corresponding times was 52.8 deg., 58.8 deg., 62.1 deg., 66.8 deg., 62.5 deg., 60.7 deg., and the quantity of moisture in a cubic foot of air being 4.685 grs., 5.709 grs., 6.320 grs., 7.217 grs., 6.377 grs., 5.973 grs., respectively.

Western Slope of the Sierra Nevada.—The western flank of this Sierra belongs to the maritime region of California, and is capable of adding greatly to its value. It is a long, wide slope, timbered and grassy, with intervals of arable land, copiously watered with numerous and bold streams, and without the cold which its name and altitude might imply. In length

it is the whole extent of the long valley at its base, five hundred miles. In breadth, it is from forty to seventy miles from the summit of the mountain to the termination of the foot hills in the edge of the valleys below, and almost the whole of it available for some useful purpose—timber, pasturage, some arable land, mills, quarries—and so situated as to be convenient for use, the wide slope of the mountain being of easy and practicable descent. Timber holds the first place in the advantages of this slope, the whole being heavily wooded, first with oaks, which predominate to about half the elevation of the mountain; and then with pines, cypress, and cedars, the pines predominating; and hence, called the pine region, as that below is called the oak region, though mixed with other trees. The highest summits of the Sierra are naked, massive granite rock, covered with snow, in sheltered places all the year round. The oaks are several varieties of white and black oak, and evergreens, some of them resembling live oak. Of the white oak there are some new species, attaining a handsome elevation, upon a stem six feet in diameter. Acorns of uncommon size, and not bad taste, used regularly for food by the Indians, abound on these trees, and will be of great value for stock. The cypress, pine, and cedar are between 100 and 250 feet high, and five to twelve feet in diameter, with clean solid stems. Grass abounds on almost all parts of the slope, except towards the highest summits, and is fresh and green all the year round, being neither killed by cold in the winter, nor dried by want of rain in the summer. The foot-hills of the slope are sufficiently fertile and gentle to admit of good settlements; while valleys, coves, beaches, and meadows of arable land are found throughout.—Many of the numerous streams, some of them amounting to considerable rivers, which flow down the mountain side, make handsome, fertile valleys. All

these streams furnish good water-power. The climate in the lower part of the slope is that of constant spring, while above, the cold is not in proportion to the elevation. Such is the general view of the western slope of the great Sierra; but deeming that all general views should rest upon positive *data*, I add some notes taken from actual observations made in different ascents and descents in 1845-6, and in different degrees of latitude, from 35 deg. to 41 deg.

December 4, 1845.—Descent from the pass, at the head of Salmon Trout river, latitude 39 deg. 17 min., elevation 7,200 feet. At three in the afternoon, the temperature at 46 deg., at sunset 34 degrees, at sunrise next morning, 22 deg.; the sky perfectly clear; no snow in the pass, but much on the mountain-tops. Here the present emigrant road now crosses. A fork of Bear river (a considerable stream, tributary to Feather river, which falls into the Sacramento), leads from the moss, and the road follows it: but finding this a rugged way, we turned to the south, and encamped in a mountain meadow of good green grass. A yellow moss very abundant on the north sides of the pines.

December 6.—The route was over good travelling ground, through open pine forest, on a broad, leading ridge, affording an excellent road. A species of cedar (*Thuya gigantea*) occurred, often of extraordinary height and size. *Pinus lambertiana* was one of the most frequent trees, distinguished among cone-bearing tribes by the length of its cones, sometimes sixteen or eighteen inches long. The Indians eat the inner part of the burr, and large heaps of them were seen where they had been collected. Leaving the higher ridges, and gaining the smoother spurs, and descending about four thousand feet, the face of the country changed rapidly. The country became low, rolling, and pretty; the pines began to disappear, and varieties of oak, and principally an ever-

green resembling live oak, became the predominating forest growth. These oaks bear great quantities of large acorns, the principal food of all the wild Indians. At a village of a few huts which we came upon, there was a large supply of these acorns—eight or ten cribs of wicker-work, containing about twenty bushels each. The best acorns are obtained from a large tree belonging to the division of white oaks, which is very abundant, and generally forms the groves on the bottom-lands of the streams—standing apart, with a clean undergrowth of grass, giving them the appearance of cultivated parks. It is a noble forest tree, already mentioned as a new species, sixty to eighty feet high, with a tufted summit of spreading branches, and frequently attains a diameter of six feet. The largest we measured reached eleven feet. The ever-green oaks generally have a low growth, with long branches and spreading tops. Some of them are suitable for ship-timber, and have already been used for that purpose.

At our evening encampment of the 8th, which was at an elevation of five hundred feet above the sea, latitude 38 deg. 53 min., and distant from the sea-coast about one hundred miles, the temperature at sunset was 48 deg., the sky clear and calm, weather delightful, and the vegetation that of early spring. We were still upon the foot hills of the mountain, where the soil is sheltered by woods, and where rain falls much more frequently than in the open Sacramento valley, near the edge of which we then were. I have been in copious, continuous rains of eighteen or twenty hours' duration in the oak region of the mountain, when not a drop fell in the valley below. Innumerable small streams have their rise and course through these foot hills, which never reach the river of the valley, but are absorbed in its light soil. The large streams coming from the upper parts of the mountain make valleys of their own, of fertile soil,

covered with luxuriant grass and interspersed with groves. This is the general character of the foot hills throughout the entire length of the Sacramento and San Joaquin valleys—a broad belt of country, and probably destined to become a vine-growing, as well as a grain and pastoral country.

December 9.—Entered the valley of the Sacramento. Fresh, green grass for eight or ten miles into the valley, cattle feeding upon it, or lying under the shade of trees—the shade being pleasant to our own feelings. Further in, towards the middle of the valley, where the spring rains had not yet commenced, the country looked parched and dry, the grass eaten down by the cattle, which were quite fat and fine beef.

Ascent, December and January, 1845-'46, latitude 37 deg. Entering the mountain by the *Rio Reyes* of Tulare lake, (December 24,) we found its general character very similar to what it was in the more northern part, (latitude 39 deg.,) the timber perhaps less heavy and more open, and the mountain generally more rough, extremely rocky in the upper parts, but wooded up to the granite ridges which compose its rocky eminences. At the elevation of 3,500 feet the ridges were covered with oaks and pines intermixed, and the bottom lands with oaks, cotton-wood, and sycamores. Small varieties of evergreen oaks reached the observed height of 9,480 feet, at which elevation, *pinus lambertiani*, and other varieties of pine, fir, and cypress, were large and lofty trees. During the latter part of December and first days of January the average temperature of the oak region, going to about 5,000 feet above the sea, was, at sunrise, 34 deg. 6 min., and at sunset 50 deg. 5 min. In the piney region, between this height and 1,100 feet, the average at sunrise was 28 deg. 7 min., and at sunset 30 deg. 4 min. The lowest observed temperature was at sunset of January 1, when the

sky had entirely cleared after a severe snow storm. The thermometer then stood at 8.5 deg., the elevation above the sea being 9,400 feet. Descending to the oak region, spring weather, rain and sunshine, prevailed. At an elevation of 4,500 feet the temperature, at the night encampment of the 3d day of January, was 38 deg. at sunset, and the same at sunrise, the grass green, and growing freshly under the oaks. The snow line was then at about 6,000 feet above the level of the sea. Rain had begun to fall in the valley of the San Joaquin in this latitude (37 deg.) on the 20th of December, and snow at the same time upon the summit of the mountain. The mean temperature of the mountain during this ascent and descent (December 24 to January 8) was 31 deg. 6 min. at sunrise, 40 deg. 4 min. at sunset.

Descent by Mr. Kern's party, latitude 35 deg. 30 min., December and January. Mr. Kern, with a detached party had crossed the Sierra about one hundred miles further south, nearly opposite the head of the Tulare lakes, and remained encamped in a valley or cove, near the summit of the Sierra, at the head of Kern's river, from December 27th to January 17th; the cove well wooded with evergreen oaks, some varieties of pine, firs and cedars, maintaining the usual majestic growth, which characterizes the cone-bearing trees of the Sierra. Until the 12th of January the weather almost that of summer, when the rains commenced, which was almost three weeks later than in latitude 37 deg. The 17th there was a fall of snow, washed off in the cove by a rain in the afternoon, the high ridges remaining covered a foot deep. The mean temperature in the cove from December 27th to January 17th was at sunrise 26 deg., at noon 60 deg., at sunset 52 deg. After that, snow and rain, alternated with sunshine, snow remaining on the ridges, and winter set in fairly on all the upper half of the mountain.

Ascent about latitude 41 deg., (April and May,) April 26, 1846—head of the lower Sacramento valley. Left the river Sacramento, going up one of the many pretty little streams that flow into the river around the head of the lower valley. On either side, low steep ridges were covered along their summits with pine, and oaks occupied the somewhat broad bottoms of the creek. Snowy peaks made the horizon on the right, and the temperature at noon was 71 deg., but the day was still and hot. The small streams are numerous here, and have much bottom land; grass and acorns abundant, and both of excellent quality. Encamped in the evening in latitude 40 deg. 38 min. 58 sec., elevation above the sea 1,080 feet, temperature at sunset 56 deg., weather pleasant. Grisly bears numerous, four being killed by the hunters after we had encamped.

April 27.—Found a good way along a flat ridge, a pretty, open mountain stream on the right, the country beginning to assume a mountainous character, wooded with mingled oak and long-leaved pine, and having a surface of scattered rocks, with grass and flowers. At noon, crossing a high ridge, the thermometer showed 61 deg. At night, at an elevation of 2,460 feet, we encamped on a creek that went roaring into the valley; temperature at sunset 52 deg.

28th, continued up the stream on which we had encamped, the country rising rapidly, clothed with heavy timber. On crossing one of the high ridges snow and *pinus lambertiani* appeared together. An hour before noon reached the pass in the main ridge, in an open pine forest, elevation 4,600 feet, thermometer at 50 deg., latitude near 41 deg. Snow in patches, and deciduous oaks mixed with the pines.

Returning upon a different line, towards the lower valley of the Sacramento, near its head, we found in the descent a truly magnificent forest. It was com-

posed mainly of a cypress and a lofty white cedar (*Thuya gigantea*) 120 to 140 feet high,) common in the mountains of California. All were massive trees; but the cypress was distinguished by its uniformly great bulk. None were seen so large as are to be found in the coast mountains near Santa Cruz, but there was a greater number of large trees—seven feet being a common diameter—carrying the bulk eighty or a hundred feet without a limb. At an elevation of four thousand six hundred feet the temperature at sunset was 48 deg., and at sunrise 37 deg. Oaks already appeared among the pines, but did not yet show a leaf. In the meadow marshes of the forest grass was green, but not yet abundant, and the deer were poor. Descending the flanks of the mountain, which fell gradually towards the plain, the way was through the same deep forest. At the elevation of about 3,000 feet the timber had become more open, the hills rolling, and many streams made pretty bottoms of rich grass; the black oaks in full and beautiful leaf were thickly studded among the open pines, which had become much smaller and fewer in variety, and when we halted near mid-day, at an elevation of 2,200 feet, we were in one of the most pleasant days of late spring; cool and sunny, with a pleasant breeze, amidst a profusion of various flowers; many trees in dark summer foliage, and some still in bloom. Among these the white spikes of the horse-chesnut, common through all the oak region, were conspicuous. We had again reached summer weather, and the temperature at noon was 70 deg.

In the afternoon we descended to the open valley of the Sacramento, 1,000 feet lower, where the thermometer was 68 deg. at sunset, and 54 deg. at sunrise. This was the best timbered region that I had seen, and the more valuable from its position near the head of the lower valley of the Sacramento, and accessible from its waters.

Bay of San Francisco and dependent country.—The bay of San Francisco has been celebrated, from the time of its first discovery, as one of the finest in the world, and is justly entitled to that character even under the seaman's view of a mere harbour. But when all the accessory advantages which belong to it—fertile and picturesque dependent country, mildness and salubrity of climate, connexion with the great interior valley of the Sacramento and San Joaquin, its vast resources for ship timber, grain and cattle—when these advantages are taken into the account, with its geographical position on the line of communication with Asia, it rises into an importance far above that of a mere harbour, and deserves a particular notice in any account of maritime California, its latitudinal position is that of Lisbon; its climate is that of southern Italy; settlements upon it for more than half a century attest its healthiness; bold shores and mountains give it grandeur; the extent and fertility of its dependent country give it great resources for agriculture, commerce, and population.

The bay of San Francisco is separated from the sea by low mountain ranges. Looking from the peaks of the Sierra Nevada, the coast mountains present an apparently continuous line, with only a single gap, resembling a mountain pass. This is the entrance to the great bay, and is the only water communication from the coast to the interior country. Approaching from the sea, the coast presents a bold outline. On the south, the bordering mountains come down in a narrow ridge of broken hills, terminating in a precipitous point, against which the sea breaks heavily. On the northern side, the mountain presents a bold promontory, rising in a few miles to a height of two or three thousand feet. Between these points is the strait—about one mile broad, in the narrowest part, and five miles long from the sea to the bay. Passing

through this gate,* the bay opens to the right and left, extending in each direction about 35 miles, having a total length of more than 70, and a coast of about 275 miles. It is divided, by straits and projecting points, into three separate bays, of which the northern two are called San Pablo and Suisoon bays. Within, the view presented is of a mountainous country, the bay resembling an interior lake of deep water, lying between parallel ranges of mountains. Islands, which have the bold character of the shores—some mere masses of rock, and others grass-covered, rising to the height of three and eight hundred feet—break its surface and add to its picturesque appearance. Directly fronting the entrance, mountains a few miles from the shore rise about 2,000 feet above the water, crowned by a forest of the lofty *cypress*, which is visible from the sea, and makes a conspicuous landmark for vessels entering the bay. Behind the rugged peak of *Mount Diavolo*, nearly 4,000 feet high (3,770) overlooks the surrounding country of the bay and San Joaquin.

The immediate shore of the bay derives, from its proximate and opposite relation to the sea the name of *contra costa* (counter-coast, or opposite coast). It presents a varied character of rugged and broken hills, rolling and undulating land, and rich alluvial shores backed by fertile and wooded ranges, suitable for towns, villages, and farms, with which it is beginning to be dotted. A low alluvial bottom land, several miles in breadth, with occasional open woods of oak, borders the foot of the mountains around the southern

* Called CHRYSOPILE (Golden Gate) on the map, on the same principle that the harbour of BYZANTIUM (Constantinople afterwards) was called CHRYSOERAS (golden horn). The form of the harbour, and its advantages for commerce, (and that before it became an entrepot of eastern commerce,) suggested the name to the Greek founders of Byzantium. The form of the entrance into the bay of San Francisco, and its advantages for commerce, (Asiatic inclusive,) suggest the name which is given to this entrance.

arm of the bay, terminating on a breadth of twenty miles in the fertile valley of St. Joseph, a narrow plain of rich soil, lying between ranges from two to three thousand feet high. The valley is openly wooded, with groves of oak, free from underbrush, and after the spring rains covered with grass. Taken in connection with the valley of San Juan, with which it forms a continuous plain, it is fifty-five miles long and one to twenty broad, opening into smaller valleys among the hills. At the head of the bay it is twenty miles broad, and about the same at the southern end, where the soil is beautifully fertile, covered in summer with four or five varieties of wild clover several feet high. In many places it is overgrown with wild mustard, growing ten or twelve feet high, in almost impenetrable fields, through which roads are made like lanes. On both sides the mountains are fertile, wooded, or covered with grasses and scattered trees. On the west it is protected from the chilling influence of the north-west winds by the *cuesta de los gatos*, (wild-eat ridge), which separates it from the coast. This is a grassy and timbered mountain, watered with small streams, and wooded on both sides with many varieties of trees and shrubbery, the heavier forests of pine and cypress occupying the western slope. Timber and shingles are now obtained from this mountain; and one of the recently discovered quicksilver mines is on the eastern side of the mountain, near the Pueblo of San Jose. This range terminates on the south in the *Anno Nuevo* point of Monterey bay, and on the north declines into a ridge of broken hills about five miles wide, between the bay and the sea, and having the town of San Francisco on the bay shore, near its northern extremity.

Sheltered from the cold winds and fogs of the sea, and having a soil of remarkable fertility, the valley of St. Joseph (San Jose) is capable of producing in great perfection many fruits and grains which do not

thrive on the coast in its immediate vicinity. Without taking into consideration the extraordinary yields which have sometimes occurred, the fair average product of wheat is estimated at fifty fold, or fifty for one sown. The mission establishments of *Santa Clara* and *San José*, in the north end of the valley, were formerly, in the prosperous days of the missions, distinguished for the superiority of the wheat crops.

The slope of alluvial land continues entirely around the eastern shore of the bay, intersected by small streams, and offering some points which good landing and deep water, with advantageous positions between the sea and interior country, indicate for future settlement.

The strait of *Carquines*, about one mile wide and eight or ten fathoms deep, connects the San Pablo and Suisoon bays. Around these bays smaller valleys open into the bordering country, and some of the streams have a short launch navigation, which serves to convey produce to the bay. Missions and large farms were established at the head of navigation on these streams, which are favourable sites for towns or villages. The country around the Suisoon bay presents smooth low ridges and rounded hills, clothed with wild oats, and more or less openly wooded on their summits. Approaching its northern shores from *Sonoma*, it assumes, though in a state of nature, a cultivated and beautiful appearance. Wild oats cover it in continuous fields, and herds of cattle and bands of horses are scattered over low hills and partly isolated ridges, where blue mists and openings among the abruptly terminating hills indicate the neighbourhood of the bay.

The *Suisoon* is connected with an expansion of the river formed by the junction of the *Sacramento* and *San Joquin*, which enter the *Francisco* bay in the same latitude, nearly, as the mouth of the *Tagus* at

Lisbon. A delta of twenty-five miles in length, divided into islands by deep channels, connects the bay with the valley of the San Joaquin and Sacramento, into the mouths of which the tide flows, and which enter the bay together as one river.

Such is the bay, and the proximate country and shores of the bay of San Francisco. It is not a mere indentation of the coast, but a little sea to itself, connected with the ocean by a defensible gate, opening out between seventy and eighty miles to the right and left, upon a breadth of ten to fifteen, deep enough for the largest ships, with bold shores suitable for towns and settlements, and fertile adjacent country for cultivation. The head of the bay is about forty miles from the sea, and there commences its connection with the noble valleys of the San Joaquin and Sacramento.

Coast country north of the bay of San Francisco.—Between the Sacramento valley and the coast, north of the bay of San Francisco, the country is broken into mountain ridges and rolling hills, with many very fertile valleys, made by lakes and small streams. In the interior it is wooded, generally with oak, and immediately along the coast presents open prairie lands, among heavily timbered forests, having a greater variety of trees, and occasionally a larger growth than the timbered region of the Sierra Nevada. In some parts it is entirely covered, in areas of many miles, with a close growth of wild oats, to the exclusion of almost every other plant. In the latter part of June and beginning of July, we found here a climate sensibly different from that of the Sacramento valley, a few miles east, being much cooler and moister. In clear weather, the mornings were like those of the Rocky mountains in August, pleasant and cool, following cold clear nights. In that part lying nearer the coast, we found the mornings sometimes cold, accompanied with chilling

winds; and fogs frequently came rolling up over the ridges from the sea. These sometimes rose at evening, and continued until noon of the next day. They are not dry, but wet mists, leaving the face of the country covered as by a drizzling rain. This sometimes causes rust in wheat grown within its influence, but vegetables flourish and attain extraordinary size.

I learned from Captain Smith, a resident at *Bodega*, that the winter months make a delightful season—rainy days (generally of warm showers) alternating with mild and calm, pleasant weather, and pure bright skies—much preferable to the summer, when the fogs and strong north-west winds, which prevail during the greater part of the year, make the morning part of the day disagreeably cold.

Owing probably to the fogs, spring is earlier along the coast than in the interior, where, during the interval between the rains, the ground becomes very dry. Flowers bloom in December, and by the beginning of February grass acquires a strong and luxuriant growth, and fruit trees (peach, pear, apple, &c.) are covered with blossoms. In situations immediately open to the sea the fruit ripens late, generally at the end of August, being retarded by the chilling influence of the north-west winds: a short distance inland, where intervening ridges obstruct these winds and shelter the face of the country, there is a different climate and a remarkable difference in the time of ripening fruits; the heat of the sun has full influence on the soil, and vegetation goes rapidly to perfection.

The country in July began to present the dry appearance common to all California as the summer advances, except along the northern coast within the influence of the fogs, or where the land is sheltered by forests, and in the moist valleys of streams and coves of the hills. In some of these was an uncommonly luxuriant growth of oats, still partially green,

while elsewhere they were dried up ; the face of the country presenting generally a mellow and ripened appearance, and the small streams beginning to lose their volume, and draw up into the hills.

This northern part of the coast country is heavily timbered, more so as it goes north to the Oregon boundary, (42 deg.,) with many bold streams falling directly into the sea.

The country between the bays of San Francisco and Monterey.—In the latter part of January, 1846, a few shrubs and flowers were already in bloom on the sandy shore of Monterey bay (lat. 36 deg. 40 min.) Among these were the California poppy, and *nemophila insignis*.

On the 5th of February I found many shrubs and plants in bloom, in the coast mountains bordering St. Joseph's valley, between Monterey and the bay of San Francisco ; and vegetation appeared much more green and spring-like, and further advanced, than in the plains. About the middle of February I noticed the *geranium* in flower in the valley ; and from that time vegetation began generally to bloom. Cattle were obtained in February, from ranchos among the neighbouring hills, extremely fat, selected from the herds in the range.

During the months of January and February rainy days alternated with longer intervals of fair and pleasant weather, which is the character of the rainy season in California. The mean temperature in the valley of St. Joseph—open to the bay of San Francisco from the 13th to the 22nd of February, was 50 deg. at sunrise, and 61 deg. at sunset. The oaks in this valley, especially along the foot of the hills, are partly covered with long hanging moss—an indication of much humidity in the climate.

We remained several days, in the latter part of February, in the upper portion of the coast mountain

between St. Joseph and Santa Cruz. The place of our encampment was 2,000 feet above the sea, and was covered with a luxuriant growth of grass, a foot high in many places. At sunrise the temperature was 40 deg.; at noon 60 deg.; at 4 in the afternoon 65 deg.; and 63 deg. at sunset; with very pleasant weather. The mountains were wooded with many varieties of trees, and in some parts with heavy forests. These forests are characterized by a cypress (*taxodium*) of extraordinary dimensions, already mentioned among the trees of the Sierra Nevada, which is distinguished among the forest trees of America by its superior size and height. Among many which we measured in this part of the mountain, nine and ten feet diameter was frequent—eleven sometimes; but going beyond eleven only in a single tree, which reached fourteen feet in diameter. Above two hundred feet was a frequent height. In this locality the bark was very deeply furrowed, and unusually thick, being fully sixteen inches in some of the trees. The tree was now in bloom, flowering near the summit, and the flowers consequently difficult to procure. This is the staple timber tree of the country, being cut into both boards and shingles, and is the principal timber sawed at the mills. It is soft, and easily worked, wearing away too quickly to be used for floors. It seems to have all the durability which anciently gave the cypress so much celebrity. Posts which have been exposed to the weather for three quarters of a century (since the foundation of the missions) show no marks of decay in the wood, and are now converted into beams and posts for private buildings. In California this tree is called the *palo colorado*. It is the king of trees.

Among the oaks is a handsome lofty evergreen species, specifically different from those of the lower grounds, and in its general appearance much resembling hickory. The bark is smooth, of a white

colour, and the wood hard and close-grained. It seems to prefer the north hill sides, where some were nearly four feet in diameter and a hundred feet high.

Another remarkable tree of these woods is called in the language of the country *madrono*. It is a beautiful evergreen with large, thick, and glossy digitate leaves, the trunk and branches reddish coloured, and having a smooth and singularly naked appearance, as if the bark had been stripped off. In its green state the wood is brittle, very heavy, hard, and close-grained; it is said to assume a red colour when dry, sometimes variegated, and susceptible of a high polish. This tree was found by us only in the mountains. Some measured nearly four feet in diameter, and were about sixty feet high.

A few scattered flowers were now showing throughout the forests, and on the open ridges shrubs were flowering; but the bloom was not yet general.

On the 25th of February, we descended to the coast near the north-western point of Monterey bay, losing our fine weather, which in the evening changed into a cold south-easterly storm, continuing with heavy and constant rains for several days.

During this time the mean temperature was 53 deg. at sunrise, 56.5 deg. at 9h., a.m., 57.5 deg. at noon, 54.5 deg. at 2h. in the afternoon, 53.4 deg. at 4, and 52.7 deg. at sunset. On the 28th, a thick fog was over the bay and on the mountains at sunrise, and the thermometer was at 38 deg.—15 deg. below the ordinary temperature—rising at nine o'clock to 59 deg. These fogs prevail along the coast during a great part of the summer and autumn, but do not cross the ridges into the interior. This locality is celebrated for the excellence and great size of its vegetables, (especially the Irish potato and onions,) with which, for this reason, it has for many years

supplied the shipping which visits Monterey. A forest of *palo colorado* at the foot of the mountains in this vicinity is noted for the great size and height of the trees. I measured one which was 275 feet in height and fifteen feet in diameter three feet above the base. Though this was distinguished by the greatest girth, other surrounding trees were but little inferior in height, and still taller. Their colossal height and massive bulk give an air of grandeur to the forest.

These trees grow tallest in the bottom lands, and prefer moist soils and north hill-sides. In situations where they are protected from the prevailing northwest winds, they shoot up to a great height; but wherever their heads are exposed, these winds appear to chill them and stop their growth. They then assume a spreading shape, with larger branches, and an apparently broken summit.

The rain storm closed with February, and the weather becoming fine, on the 1st of March we resumed our progress along the coast. Over the face of the country between Santa Cruz and Monterey, and around the plains of St. John, the grass, which had been eaten down by the large herds of cattle, was now everywhere springing up; flowers began to show their bloom, and in the valleys of the mountains bordering the Salinas plains, (a plain of some fifty miles in length, made by the Salinas river,) wild oats were three feet high, and well headed, by the 6th of March.

During three days that we remained on one of these mountains, at an elevation of 2,200 feet above the sea, and in sight of Monterey, the mean temperature was 44 deg. at sunrise, 55 deg. at 9 in the morning, 60 deg. at noon, 62 deg. at 2 in the afternoon, 57 deg. at 4, and 53 deg. at sunset. At the same hours the dew point was 42.0 deg. 58.1 deg., 52.8 deg., 54.9 deg., 52.9 deg., 51.6 deg., and the

quantity of moisture in a cubic foot of air, 3.283 grs., 3.982 grs., 4.726 grs., 4.972 grs., 4.682 grs., and 4.558 grs., respectively. The weather remained bright and pleasant; fogs sometimes covering the mountains at sunrise, but going off in a few hours. These are open mountains untimbered, but fertile in oats and other grasses, affording fine range for cattle. Oaks and pines are scattered thinly over the upper parts, and in the higher and more exposed situations the evergreen oaks show the course and influence of the northwest winds, stunted and blighted by their chillness, bent to the ground by their force, and growing in that form.

Descending into the valley of the San Joaquin, (March 11th, we found almost a summer temperature, and the country clothed in the floral beauty of advanced spring.

Southern country and rainy season, (latitudes 32 deg.—35 deg.)—South of Point Conception the climate and general appearance of the country exhibit a marked change. The coast from that cape trends almost directly east, the face of the country has a more southern exposure, and is sheltered by ranges of low mountains from the violence and chilling effects of the northwest winds; hence the climate is still more mild and genial, fostering a richer variety of productions, differing in kind from those of the northern coast.

The face of the country along the coast is generally naked, the lower hills and plains devoid of trees, during the summer heats parched and bare, and water sparsely distributed. The higher ridges and the country in their immediate vicinity are always more or less, and sometimes prettily, wooded. These usually afford water and good green grass throughout the year. When the plains have become dry, parched and bare of grass, the cattle go up into these ridges, where, with cooler weather and shade, they find

water and good pasture. In the driest part of the year we found sheep and cattle fat, and saw flowers blooming in all the months of the year. Along the foot of the main ridges the soil is rich and comparatively moist, wooded, with grass and water abundant; and many localities would afford beautiful and productive farms. The ranges of the *Sierra Nevada* (here approaching its termination) still remain high—some peaks always retaining snow—and afford copious streams, which run all the year. Many of these streams are absorbed in the light soil of the larger plains before they reach the sea. Properly directed, the water of these rivers is sufficient to spread cultivation over the plains. Throughout the country every farm or *rancho* has its own springs or running stream sufficient for the support of stock, which hitherto has made the chief object of industry in California.

The soil is generally good, of a sandy or light character, easily cultivated, and in many places of extraordinary fertility. Cultivation has always been by irrigation, and the soil seems to require only water to produce vigorously. Among the arid brush-covered hills of San Diego, we found little valleys converted by a single spring into crowded gardens, where pears, peaches, quinces, pomegranates, grapes, olives, and other fruits grew luxuriantly together, the little stream acting upon it like a principle of life.—The southern frontier of this portion of California seems eminently adapted to the cultivation of the vine and the olive. A single vine has been known to yield a barrel of wine; and the olive trees are burdened with the weight of fruit.

During the month of August the days are bright and hot, the sky pure and entirely cloudless, and the nights cool and beautifully serene. In this month fruits generally ripen—melons, pears, peaches, prickly fig (*cactus tuna*,) &c.,—and large bunches of ripe

grapes are scattered numerously through the vineyards, but do not reach maturity until the following month. After the vintage, grapes are hung up in the houses, and so kept for use throughout the winter.

The mornings in September are cool and generally delightful—we sometimes found them almost cool enough to freeze—the mid-day hours bright and hot, but a breeze usually made the shade pleasant; the evenings calm, and nights cool and clear when unobscured by fogs. We reached the southern country at the end of July; and the first clouds we saw appeared on the 6th of *September*, at sunset, gradually spreading over the sky, and the morning was cloudy, but clear again before noon. Lightning at this time was visible in the direction of Sonora, where the rainy season had already commenced, and the cloudy weather was perhaps indicative of its approach here. On some nights the dews were remarked to be heavy; and as we were journeying along the coast between San Diego and Santa Barbara, fogs occasionally obscured the sunset over the ocean, and rose next morning with the sun. On the wooded plain, at the foot of the San Gabriel mountain, in the neighbourhood of Santa Barbara, and frequently along the way, the trees were found to be partly covered with moss.

Country between the Santa Barbara mountain and Monterey, (lat. 34 deg. 30 min. to 36 deg. 30 min.)—About the middle of September we encamped near the summit of the Cuesta de Santa Ines, (Santa Barbara mountain,) on a little creek with cold water, good fresh grass, and much timber; and thence-forward north along the mountain behind the Santa Ines mission, the country assumed a better appearance, generally well wooded and tolerably well covered with grass of good quality—very different from the dry, naked and parched appearance of the country below Santa Barbara. The neighbouring mountain exhibited large timber, redwood or pine, probably the latter.

Water was frequent in small running streams. Crossing the fertile valley of San Luis Obispo, (lat. 35 deg.,) a sheltered valley noted for the superiority of its olives, we entered the Santa Lucia range, which lies between the coast and the Salinas, or Buenaventura river (of the bay of Monterey.) We found this a beautiful mountain, covered thickly with wild oats, prettily wooded, and having on the side we ascended (which is the water-shed) in every little hollow a running stream of cool water, which the weather made delightful. The days were hot, at evening cool, and the morning weather clear and exhilarating. Descending into the valley, we found it open and handsome, making a pleasing country well wooded, and everywhere covered with grass of a good quality. The coast range is wooded on both sides and to the summit with varieties of oaks and pines. The upper part of the Salinas valley, where we are now travelling, would afford excellent stock farms, and is particularly well suited to sheep. The country never becomes miry in the rainy season, and none are lost by cold in the mild winter.

The good range, grass and acorns, made game abundant, and deer and grisly bear were numerous. Twelve of the latter were killed by the party in one thicket.

Lower down, in the neighbourhood of San Miguel, the country changed its appearance, losing its timbered and grassy character, and showing much sand. The past year had been one of unusual drought, and the river had almost entirely disappeared, leaving a bare sandy bed with a few pools of water. About fifteen miles below San Miguel it enters a gorge of the hills, making broad thickly wooded bottoms, and affording a good range and abundance of water, the bed being sheltered by the thick timber. The lower hills and spurs from ranges, bordering the river, are very dry and bare, affording little or no grass. Approaching

the mission of Soledad, the river valley widens, making fertile bottoms and plains of arable land, some fifteen to twenty miles broad, extending to Monterey bay, and bordered by ranges of mountain from two to three thousand feet high. These ranges have the character of fertile mountains, their hills being covered with grass and scattered trees, and their valleys producing fields of wild oats, and wooded with oak groves. Being unsheltered by woods, water is not abundant in the dry season, but at the end of September we found springs among the hills, and water remained in the creek beds.

On the evening of the 25th September, *cumuli* made their appearance in the sky, and the next morning was cloudy with a warm southerly wind and a few drops of rain—the first of the rainy season. The weather then continued uninterruptedly dry through all October—fair and bright during the first part, but cloudy during the latter half. At the end of the month the rainy season set in fully, consisting generally of rain squalls with bright weather intervening, and occasional south-easterly storms continuing several days. The previous seasons had been very short and light for several years, and the country had suffered from the consequent drought. The present season commenced early, and was very favourable. Much rain fell in the low country, and snow accumulated to a great depth in the high mountains. The first rains changed the face of the country. Grass immediately began to shoot up rapidly, and by the end of the first week of November the dead hue of the hills around Monterey had already given place to green.

A brief sketch of the weather during a journey in this year from the mission of San Juan Baptista (latitude 37 deg.) to los Angeles will exhibit the ordinary character of the season.

In the valley of San Juan, during the latter half

of November, there was no rain; the weather, generally, pleasant and bright, with occasional clouds. The nights clear and cool, occasionally cold; the mornings clear and sharp, with hoar frost sometimes covering the ground. The days were warm and pleasant, and evenings mild and calm. On some mornings a thick fog settled down immediately after sunrise, but in a few hours cleared off into a pleasant day.

The falling weather recommenced on the 30th, with a stormy day of spring; blue sky in spots, rapidly succeeded by masses of dark clouds and pouring rain, which fell heavily during greater part of the night.

The morning of the 1st December was partially clear, but rain recommenced in a few hours, with sky entirely clouded. The weather brightened at noon, and from a high point of the hills bordering the St. Juan river valley, up which we were travelling, snow was visible on the summits of the dividing range between the San Joaquin valley and the coast. It rained heavily and incessantly during the night, and continued all the next day. In the night the sky cleared off bright with a north wind, but clouded up at morning, with rain and broken sky. There were showers of rain during the day, with intervals of bright and hot sun; and the sky at sunset was without a cloud.

During the day and night of the 4th, there were occasional showers. The sky was tolerably clear on the morning of the 5th, with a prospect of fair weather. The tents were frozen, and snow appeared on the near ridges. We were then in a small interior valley of the mountains, bordering the Salinas river, and about 1,000 feet above the sea.

December the 6th was a beautiful day, followed by a cold frosty night.

The next day we descended to the valley of the

Salinas river, the weather continuing clear and pleasant during the day. Snow appeared on the mountains on both sides of the valley, and a cloud from some of them gave a slight shower during the night. Several successive days were clear, with hot sun; the nights cold, starry, and frosty. The new grass on the hills was coming out vigorously. The morning of the 10th was keen and clear, with scattered clouds, and a southerly wind, which brought up showers of rain at night, followed by fog in the morning.

On the 12th, at the mission of Santa Margarita, in the head of the Salinas valley, rain began in the afternoon, with a cold wind, and heavy rain during all the night. The 13th was cloudy, with occasional showers. During the night the weather became very bad, and by morning had increased to a violent and cold south-easterly rain storm. In the afternoon the storm subsided, and was followed by several days of variable weather.

By the 19th, the country where we were travelling between San Luis Obispo and the Cuesta of Santa Ines, showed a handsome covering of grass, which required two weeks more to become excellent. There were several days of warm weather, with occasional showers and hot sun, and cattle began to seek the shade.

The 23d was a day of hard rain, followed by fine weather on the 24th, and a cold south-easterly rain storm on the 25th.

During the remainder of the year, the weather continued fair and cool.

No rain fell during the first half of January, which we passed between Santa Barbara and Los Angeles: the days were bright and very pleasant, with warm sun; and the nights, generally, cold. In the neglected orchards of the San Buenaventura and Fernando missions, the olive trees remained loaded with

abundant fruit, which continued in perfectly good condition.

About the 14th, a day of rain, succeeded by an interval of fine weather, again interrupted by a rainy, disagreeable south-easter on the 23rd. During the remainder of the month the days were bright and pleasant—almost of summer—sun and clouds varying; the nights clear, but sometimes a little cold; and much snow showing on the mountain overlooking the plains of San Gabriel.

In the first part of February, at Los Angeles, there were some foggy and misty mornings, with showers of rain at intervals of a week. The weather then remained for several weeks uninterruptedly and beautifully serene, the sky remarkably pure, the air soft and grateful, and it was difficult to imagine any climate more delightful. In the meantime the processes of vegetation went on with singular rapidity, and, by the end of the month, the face of the country was beautiful with the great abundance of pasture, covered with a luxuriant growth of geranium, (*erodium cicutarium*,) so esteemed as food for cattle and horses, and all grazing animals. The orange trees were crowded with flowers and fruit in various sizes, and along the foot of the mountain, bordering the San Gabriel plain, fields of orange-coloured flowers were visible at the distance of fifteen miles from Los Angeles.

In the midst of the bright weather there was occasionally a cold night. In the morning of March 9, new snow appeared on the San Gabriel mountain, and there was frost in the plain below; but these occasionally cold nights seemed to have no influence on vegetation.

On the 23d and 27th of March there were some continued and heavy showers of rain, about the last of the season in the southern country. In the latter part of April fogs began to be very frequent, rising

at midnight and continuing until 9 or 10 of the following morning. About the beginning of May the mornings were regularly foggy until near noon; the remainder of the day, sunny, frequently accompanied with high wind.

The climate of maritime California is greatly modified by the structure of the country, and under this aspect may be considered in three divisions—the southern, below Point Conception and the Santa Barbara mountain, about latitude 35 deg.; the northern, from Cape Mendocino, latitude 41 deg., to the Oregon boundary; and the middle, including the bay and basin of San Francisco and the coast between Point Conception and Cape Mendocino. Of these three divisions the rainy season is longest and heaviest in the north and lightest in the south. Vegetation is governed accordingly—coming with the rains—decaying where they fail. Summer and winter, in our sense of the terms, are not applicable to this part of the country. It is not heat and cold, but wet and dry, which mark the seasons; and the winter months, instead of killing vegetation, revive it. The dry season makes a period of consecutive drought, the only winter in the vegetation of this country, which can hardly be said at any time to cease. In forests, where the soil is sheltered,—in low lands of streams and hilly country, where the ground remains moist, grass continues constantly green and flowers bloom in all the months of the year. In the southern half of the country, the long summer drought has rendered irrigation necessary, and the experience of the missions, in their prosperous day, has shown that, in California, as elsewhere, the driest plains are made productive, and the heaviest crops produced by that mode of cultivation. With irrigation a succession of crops may be produced throughout the year. Salubrity and a regulated mildness characterize the climate; there being no prevailing diseases, and the extremes of heat

during the summer being checked by sea breezes during the day, and by light airs from the Sierra Nevada during the night. The nights are generally cool and refreshing, as is the shade during the hottest day.

California, below the Sierra Nevada, is about the extent of Italy, geographically considered in all the extent of Italy from the Alps to the termination of the peninsula. It is of the same length, about the same breadth, consequently the same area (about one hundred thousand square miles), and presents much similarity of climate and productions, the effect of differences of latitude, proximity of high mountains, and configuration of the coast. Like Italy, it is a country of mountains and valleys: different from it in its internal structure, it is formed for *uniting*; its large rivers being concentric, and its large valleys appurtenant to the great central bay of San Francisco, with the area of whose waters the dominating power must be found.

Geographically, the position of this California is one of the best in the world; lying on the coast of the Pacific, fronting Asia, on the line of an American road to Asia, and possessed of advantages to give full effect to its grand geographical position.

All which is respectfully submitted:

J. CHARLES FREMONT.

WASHINGTON, June, 1848.

MAJOR EMORY'S NARRATIVE.

PREFATORY NOTICE.

WASHINGTON. *September 1, 1847.*

To Col. J. J. ABERT, *Chief of the Corps of Topographical Engineers:*

SIR: The following order was received by me June 5, 1846:

BUREAU OF TOPOGRAPHICAL ENGINEERS.

Washington, June 5, 1846.

SIR: You will repair, without delay, to Fort Leavenworth, and report yourself and party to Colonel Kearny, 1st dragoons, as field and topographical engineers of his command. In addition to yourself, the party will consist of—

First Lieutenant Warner, now at Washington.

Second Lieutenant Abert, do.

Second Lieutenant Peck.

Lieutenant Peck is at West Point, but he has been ordered to repair to St. Louis, and report to you at that place. Should Colonel Kearny be at St. Louis, which you will ascertain on passing through that place, you will report to him at St. Louis.

Although ordered to report as field and topographi-

cal engineers, under the regulations, you will not consider these in the light of exclusive duties, but will perform any military duty which shall be assigned to you by Colonel Kearney in accordance with your rank.

Should Colonel Kearney have moved on the prairies with his command, you will make every effort to overtake him.

Respectfully, sir, your obedient servant,

J. J. ABERT.

Colonel Topographical Engineers.

To Lieut. W. H. EMORY, *Top. Eng.*

Anticipating that the route of General Kearny's command would be through unexplored regions, your suggestions required, that in all cases where it did not interfere with other and more immediate military demands of the service, the attention of myself, and the officers assigned to duty with me, should be employed in collecting data which would give the government some idea of the regions traversed.

The column commanded by Colonel Kearney, to which we are attached, styled 'The Army of the West,' to march from Fort Leavenworth, was destined to strike a blow at the northern provinces of Mexico, more especially New Mexico and California.

It was supposed we would barely reach Fort Leavenworth in time to join the army, and but twenty-four hours were allowed us in Washington to collect the instruments and other conveniences for such an expedition. This was quite sufficient for all the objects appertaining directly to our military wants, but insufficient for the organization and outfit of a party intended for exploration. In submitting the following notes, they should be received as observations made at intervals snatched from other duties, and with an expedition whose movements were directed by other

considerations than those which would influence the views and conveniences of an explorer.

We left Washington on the 6th of June, unable to procure a pocket chronometer, or telescope of power sufficient to observe eclipses; but through your intercession, and by the kindness of the Chief of Hydrography, U. S. N., we were provided with two excellent box chronometers, No 783 and No. 2075, by Parkinson and Frodshan, and we received from the bureau two of Gambey's 8 $\frac{1}{2}$ inch sextants.

Crossing the Alleghanies the stage capsized with us, and placed the chronometers in great danger; but the prudence of Mr. Bestor, who carried them in a basket on his arm, saved them from destruction. Their rates were changed very materially by the accident, but subsequent observations showed no other injury had been incurred.

Elaborate observations for time and rate were made at St. Louis; from which place, being tolerably well established in geographical position, it was intended to carry the longitude by chronometer, but, on reaching Fort Leavenworth, the chronometers were again found to have changed their rates materially, owing to the peculiarly unsteady and jarring motion of the steamer upon which we ascended.

The meridian of Fort Leavenworth, as determined by Mr. Nicollet, is therefore taken as that to which all the determinations of longitude as far as Bent's fort, by the chronometer, are referred; and any change which subsequent observations may make in the longitude of Fort Leavenworth, will be common to them. The travelling rates of chronometer 783 were, as the observations will show, very uniform; and longitudes deduced from it, compared with direct measurement of lunar distances made at various points, give satisfactory comparisons as far as camp 70, October 9th, on the Rio del Norte. At this point

we left the waggons, thence crossing the mountains to the Gila river, some irregularity in the rates is discoverable, until we reach camp 83, October 26th, on the Gila river.

From that point (camp 83, to San Diego, on the Pacific, the rates were very uniform. Assuming Captain Belcher's determination of San Diego, 7h. 48m. 44s., west from Greenwich, and carrying my longitudes back, they compare well with the longitudes derived from the direct measurements of lunar distances made at different points on the route.

The longitude between the camps of October 9th and October 26th is derived from direct measurements, and from lunar distances.

OF THE LATITUDES.

The latitudes were determined by measuring with one of the Gambey sextants the double altitudes of stars near the meridian, and at all important points by observations on north and south stars as nearly as they could be obtained of equal altitudes. At these last points, where the observations are multiplied, their places may be depended upon to the nearest five seconds.

OF LOCAL TIME.

The local time was, in all cases, determined by altitudes of the heavenly bodies on different sides of the meridian.

The astronomical observations, were computed, in the first place, by myself and Mr. Bestor, and subsequently by Professor J. C. Hubbard. The results of these observations are the final computations of Professor Hubbard, whose well-earned reputation as a computer entitles his work to entire confidence. These observations established the geographical position of 52 points, extending from Fort

Leavenworth to the Pacific, most of which lie in regions before undetermined.

HEIGHTS ABOVE THE SEA.

At Fort Leavenworth, through the liberality of the medical department, I was furnished with a syphon barometer, by Bunten, No. 515, the comparison of which, with the standard at Paris, is given in the subjoined note.

Observatoire.—Comparison du barometre a syphon, No. 515 de Bunten, avec le barometre de l'observatoire.

Le barometre No. 515, donne des hauteurs plus grandes que celles qui sont indiquees par le barometre de l'observatoire, la difference est de 0.45 centimes de millemetre.

Barometre,	{	No. 515	759.19
		Observatoire	758.74
Difference			00.45

AROMETRE DE.

	L'observatoire.		No. 515.	
12.9	758.29	00.40	758.60	12.5
12.0	761.50	00.50	762.00	11.8
11.3	762.14	00.56	762.70	11.0
10.3	758.06	00.44	758.50	10.0
8.7	753.80	00.35	756.15	8.8
		2.25		
		00.45		

PARIS le 5 Fevrier, 1843.

GORYAZ.

The discussion of the data upon which the heights indicated by the barometer have been founded, would, if pursued, occupy some space; for the present, it will be sufficient to say that the basis of comparison, as far as Santa Fe, is a series of observations made at Fort Leavenworth, with the same instrument, running through two years; and the height of the hospital at Fort Leavenworth above the sea assumed at 912 feet.

From Santa Fe, down the Del Norte, and thence west as far as camp 83, of October 26th, the basis of comparison is the series of observations, running through two months, at Santa Fe.

From the camp of October 26th, on the Gila, the basis of comparison is the mean of the observations made at San Diego, on the Pacific, near the level of the sea. The barometer was left on the Pacific, under the charge of Lieutenant Warner, topographical engineer; and the further observations made with it on that coast will afford, at some future time, data upon which to reconsider the results now given, particularly those in the last section. In the absence of corresponding observations, the object has been to get a column of reference, progressing west, with the places observed at.

The formula used is that of Altman's. The heights deduced are marked on the map; but they should be considered, at best, but as near approximations to the truth.

The time of day at which the observations were made is not that which experience has shown to be best; but, the halts being beyond my control, I was compelled to yield to circumstances.

As far as Santa Fe, I received the assistance of Lieutenants J. W. Abert and G. W. Peck, of the corps of topographical engineers, and Mr. Norman Bestor; all of whom deserve notice for the zeal and industry with which they performed their duty.

Whilst with me, Lieutenant Peck made the topographical sketches ; after he left, they were made by Lieutenant Warner.

I would here gladly avail myself of the opportunity of thanking Colonel Robert Campbell and Dr. Engelmann, of St. Louis, for the disinterested and efficient aid they rendered us in St. Louis in our hurried preparations for a long and tedious journey. The advice given us by Colonel Campbell, a gentleman of great experience in prairie life, was felt beneficially to the last of the journey.

The country between Fort Leavenworth and Santa Fe, traversed by the army of the west, may be divided into three great divisions, distinct in character, climate, and products, viz. : from Fort Leavenworth to Pawnee fork ; from Pawnee fork to Bent's Fort ; and from Bent's Fort to Santa Fe.

The two first divisions have been so often traversed, that I have omitted my diary embracing them, contenting myself with a few general remarks ; but the scientific, and especially astronomical observations referring to them, are as full as in regard to the other regions.

For the information of detachments moving on that route, a table of distances has been prepared ; which, with the map, (though on rather too small a scale for military purposes,) may enable movements to be made without other guides.

Between Fort Leavenworth and Pawnee fork, the country is a high, rolling prairie, traversed by many streams, the largest of which is the Kansas, or " Kaw ;" and all but this river may be forded, except during freshets.

The beds of the streams are generally deeply indented in the soil, and their banks are almost vertical, developing, where the streams make their incisions in the earth, strata of fossiliferous limestone,

of various shades of brown, filled with the remains of crinoidea.

On a branch of the Wah-Karrussi, where the Oregon trail strikes it, a seam of bituminous coal crops out. This is worked by the Indians, one of whom we met driving an ox-cart loaded with coal to Westport. For the most part, the soil is a sandy loam, covered with rich vegetable deposit; the whole based upon a stratum of clay and limestone.

Trees are to be seen only along the margins of the streams, and the general appearance of the country is that of vast, rolling fields, inclosed with colossal hedges. The growth along these streams, as they approach the eastern part of the section under consideration, consists of ash, bur oak, black walnut, chesnut oak, long-leaved willow, sycamore, buck-eye, American elm, pig-nut hickory, hack-berry, and sumach; towards the west, as you approach the 99th meridian of longitude, the growth along the streams becomes almost exclusively cotton wood. Council Grove creek forms an exception to this, as most of the trees enumerated above flourish in its vicinity, and render it, for that reason, a well-known halting-place for caravans, for the repairs of waggons, and the acquisition of spare axles.

On the uplands the grass is luxuriant, and occasionally is found the wild tea and pilot-weed.

As you draw near the meridian of Pawnee Fork, 99 deg. west of Greenwich, the country changes, almost imperceptibly, until it merges into the arid, barren wastes described under that section. The transition is marked by the occurrence of cacti and other spinose plants, the first of which we saw in longitude 98 degrees.

Near the same meridian the buffalo grass was seen in small quantities, and, about noon, our party was cheered for the first time by the sight of a small "band" of buffalo, two of which we killed, at the ex-

pense of a couple of fine horses, which never recovered from the chase. Horses occasionally fed on grain become very weak feeding on grass alone, and should never in that condition be subjected to quick work. A violation of this precept has cost many volunteers their horses, and entailed trouble without end on many inexperienced travellers "westward bound." The next day immense herds of buffalo were seen.

We were now on ground which is traversed by the nomadic tribes of Pawnees, Sioux, Osages, and occasionally the Camanches. Their range is seldom farther east than Council Grove. The country thence, to the western borders of Missouri, is in the hands of Indians owing allegiance to, and receiving stipends from, the United States; they live in log-houses, cultivate the soil, rear cattle, and pursue some of the arts of peace. They form the connecting link between the savages of the plains and the white man of the States.

The latitude of our camp, a few thousand feet south-east of where the road crosses the Pawnee Fork, is 38 deg. 10 min. 10 sec.; and the longitude, by chronometer, is 98 deg. 55 min. 22. The height above the sea, indicated approximately by the barometer, is 1932 feet; the point is but a short distance from the junction of the Pawnee Fork and the Arkansas river.

The section of country embraced between this point and Bent's Fort is totally different in character from that just described, but the change is gradual, and may be anticipated from what has been said in reference to the appearance of the country so far east as the 98th degree, or even the same 97th meridian.

The position of our camp near Bent's Fort, determined by 29 altitudes of Polaris and 35 circum-meridian altitudes of alpha aquilæ, is 38 deg. 02 min.

53 sec. and the longitude, by the measurement of distances between the moon and alpha aquilæ and alpha virginis, is 103 deg. 01 min. agreeing with 34 sec. with the chronometric determination of the point.

Our route from Pawnee Fork to this point was along the Arkansas river. The approximate height of Bent's Fort above the sea is 3,958 feet, and the height where we first struck the river, at the bend, is 1,658 feet, the distance between these two points being 311 miles, the fall of the river is about seven feet and four-tenths per mile. Its bed is of sand, sometimes of rounded pebbles of the primitive rock. It is seldom more than 150 yards wide, and, but for the quicksands, is everywhere fordable. The bottom land, a few feet above the level of the water, varies in width from half a mile to two miles, and is generally covered with good nutritious grass. Beyond this the ground rises by gentle slopes into a wilderness of sand-hills on the south, and into prairie on the north. There are one or two exceptions; for instance, at the great bend, the sandhills from the south impinge abruptly on the course of the river; at Pawnee rock, a long swell in the ground terminates in an abrupt hill of highly ferruginous sandstone; and ten miles above Chouteau's island, the hills along the river are vertical, as if the river had cut a passage through them; and, as you approach Bent's Fort, the hills generally roll in more boldly on the river, and the bottoms become narrower, and the grass more precious.

At these places the geological formation can be seen distinctly. On the lower part of the river it is a conglomerate of pebbles, sometimes shells cemented by lime and clay overlaying a stratum of soft sand-stone, which in turn, overlays a blue shale, and sometimes the richest description of marl.

Higher up the river, we find the same formation,

but in addition argillaceous limestone, containing ammonites and other impressions of shells in great variety, and in more than one instance distinct impressions of oyster shells. The dip in both cases about 6 deg., and a little north of east.

The soil of the plains is a granite sand, intermixed with the exuviae of animals and vegetable matter, supporting a scanty vegetation. The eye wanders in vain over these immense wastes in search of trees. Not one is to be seen. The principal growth is the buffalo grass, cacti in endless variety, and very rarely that wonderful plant, the *Opomea leptophylla*, called by the hunter, man-root, from the similarity of its root in size and shape to the body of a man. It is esculent, and serves to sustain human life in some of the many vicissitudes of hunger and privation to which men who roam the prairies, as an occupation, are subjected.

July 24.—Near the dry mouth of the Big Sandy creek, the *Yucca Angustifolia*, palmello of the Spaniards, or soap plant, first made its appearance, and marked a new change in the soil and vegetation of the prairies.

The narrow strip which I have described as the bottom land of the Arkansas, varying from half a mile to two or three miles wide, contains a luxuriant growth of grasses, which, by the judicious selection and distribution of the camps, sustained all the animals of the army of the west whilst on the river. The only tree of any magnitude found on its course is the cotton-wood, (*Populus Canadensis*,) and it frequently happens that not one of these is seen in a whole day's journey, and the buffalo dung and wild sage constitute the only fuel to be procured. About eighty-five miles before reaching Bent's Fort is found what is called the "big timber." Here the valley of the river widens, and the banks on either side fall towards it in gentle slopes. The "big timber," is a

thinly scattered growth of large cotton-woods not more than three quarters of a mile wide, and three or four miles long. It is here the Chyennes, Arapahoes, and the Kioways sometimes winter, to avail themselves of the scanty supply of wood for fuel, and to let their animals browse on the twigs and bark of the cotton-wood. The buffaloes are sometimes driven by the severity of the winter, which is here intense for the latitude, to the same place, to feed upon the cotton-wood. To this point, which has been indicated to the government as a suitable one for a military post, Mr. Bent thinks of moving his establishment.

In addition to the grasses and cotton-wood mentioned, we find in the bottoms wild plum, wild cherry, willow, summer grape, cat-tail, scouring rush, a powerful diuretic upon horses, Mexican poppy, and other plants.

The animals of this section of the country are the buffalo, deer, antelope, elk, marmot, wolf, agama cornuta, &c.; but, for a more specific knowledge of the natural history of the region from Fort Leavenworth to Bent's Fort, reference is made to the interesting notes of one of my assistants, Lieutenant Abert, in the appendix.

Except the buffalo, game is very scarce, and cannot be depended upon to support a party of men, however small their number. The buffalo, where they range, may be relied upon to support a column of many thousand men; but their range is very uncertain. This year it was westward, between the 98th degree and the 101st meridian of longitude.

For an account of the country from Bent's Fort to the Pacific, I submit my notes, in which I have set down what passed under my own observation.

The military force under Colonel Kearny, destined for the conquest of New Mexico and the countries beyond, consisted of two batteries of artillery, (6-

pounders) under the command of Major Clark, three squadrons of the first dragoons, under Major Sumner, the first regiment of Missouri cavalry, under Colonel Doniphan, and two companies of infantry, under Captain Agney. This force was detached in different columns from Fort Leavenworth, and were concentrated with admirable order and precision on the 1st of August, at a camp nine miles below Bent's Fort.

And here I would take occasion to speak of the excellent understanding which prevailed throughout between regulars and volunteers, and the cheerfulness with which they came to each other's assistance whenever the privations and hardship of the march called for the interchange of kindly offices among them. The volunteers, though but recently accustomed to the ease and comforts of smiling homes, bore up against fatigue, hunger, and the vicissitudes of a long and tedious march, through unexplored regions, with a zeal, courage, and devotion that would have graced time-worn veterans, and reflect the highest credit on their conduct as soldiers. There was a noble emulation in the conduct of regulars and volunteers, which in no small degree benefited the service; while, at the same time, it promoted that cordiality in their intercourse, which will make their future meetings, in the more peaceful walks of life, a gladsome event to both.

NOTES.

August 2, 1846.—I looked in the direction of Bent's Fort, and saw a huge United States flag flowing to the breeze, and straining every fibre of an ash pole planted over the centre of a gate. The mystery was soon revealed by a column of dust to the east, advancing with about the velocity of a fast walking horse—it was “the Army of the West.” I ordered my horses to be hitched up, and, as the column passed, took my place with the staff.

A little below the fort the river was forded without difficulty, being paved with well attritioned pebbles of the primitive cock, and not more than knee deep.

We advanced five miles along the river, where its bed slides over a black, carbonaceous shale, which has been mistaken for coal, and induced some persons to dig for it.

Here we turned to the left, and pursued our course over an arid, elevated plain, for twenty miles without water. When we reached the Timpas, we found the water in puddles, and the grass bad.

Colonel Doniphan was ordered to pursue the Arkansas to near the mouth of the Timpas, and rejoin the army by following the bed of that stream.

Near where we left the Arkansas we found, on the side of the slope, several singular demi-spheroids, about the size of an umbrella, coated with carbonate of lime, in pyramidal crystals, which, at a distance, resembled the bubbles of a huge boiling caldron.

Along the Arkansas the principal growth consists of very coarse grass, and a few cotton-woods and willows. The plains were covered with very short

grass, *Sesleria Dactyloides*, now burnt to cinder, and artemisia.

The only animals seen were one black-tailed rabbit and an antelope; both of which were killed.

Our march was 26 miles, that of the army 37; the last 20 miles without water.

The artillery arrived in camp about 11, P.M.; both men and horses were parched with thirst. The teamsters, who had to encounter the dust, suffered very much. When water was near, they sprang from their seats and ran for it like madmen. Two horses sank under this day's march.

Our ascent was considerable to-day. The height, indicated by the barometer, being 4,523 feet above the level of the sea.

August 3.—We ascended the Timpas six and three-quarter miles, and halted for the day near running water; the grass was all burned dry, and not a green spring to be seen. Three buttes were passed, of singular appearance. They were composed of limestone, and were garnished at their bases with nodules of carbonate of lime, like those described yesterday. A part of our road was on the dry bed of a river, paved with argillaceous limestone, containing, now and then, the impression of oyster shells very distinctly. The valley in which we encamped presented the appearance of a crater, being surrounded with buttes, capped with stunted cedar. The stratification, however, appeared regular, and to correspond on different sides of the valley.

The growth of to-day was similar to that found on the plains yesterday, to which may be added an evergreen and a magnificent cactus, three feet high, with round limbs shaped like a rope, three and a half inches in diameter, branching at right angles. It is said the Mexicans make hedges of it.

Colonel Doniphan's regiment passed our camp about 4, P. M.

The water was in pools, charged with vegetable matter and salt.

The formation of the adjacent hills was distinct; first, a stratum of limestone, ten feet thick, then hard sandstone, with ammonites and a variety of other shells, &c., overlaying blue marl. From the sides of the hills protruded geodes, with crystallized limestone, and the ground was everywhere strewed with detached pieces of ferruginous sandstone. On these hills we found cedar growing, very stunted; Missouri flax; several varieties of wild currants; a very stunted growth of plums; moss and cacti in great variety, but diminutive.

The latitude of this camp, by nine observations on Polaris, out of the meridian, is 37 deg. 44 min. 46 sec.

The longitude derived from the chronometer, by an estimate of the local time derived from eight measurements of the double altitude of Arcturus on the west, and seven of Alpha Aquilæ in the east, is 6h. 54m. 06.7s.

The barometer reading indicates a height above the sea of 4,761 feet.

August 4.—The road wound through the valley of the Timpas. The soil, being impregnated with lime, rendered the dust, which rose in dense columns, distressing.

Dwarfed cedar skirted the road on each side. The strata of hills on either side of the valley were the same as described yesterday; but the ferruginous nodules and blocks of sandstone were more frequent.

Thirteen miles' march brought us to the crossing of the Timpas. The only water we found there was in a hole forty feet deep in diameter, into which the men rushed with eagerness, disturbing the vegetable deposit formed on the surface, and thereby rendering it unfit for use. Nine miles further on we came to

"the hole in the rock"—a large hole filled with stagnant, though drinkable water.

We saw at times, during the day, a few antelopes, rabbits, wild horses, jackdaws, meadow-larks, and king-birds. The pasture was so bad that Colonel Kearney determined to march to the "hole in the prairie," the neighbourhood of which, though said to be destitute of water, affords some dry grass.

We passed a dead horse belonging to the infantry, black with crows, and a wolf in their midst, quietly feeding on the carcass. This gave us unpleasant forebodings for our noble, but now attenuated horses.

We reached the "hole in the prairie" at 10 p.m., the distance being 14½ miles, and found grass, as we expected : we were agreeably surprised to find water also. The night was delicious, and all slept in the open air. The infantry were encamped here.

The total distance was 36 miles. The horses were now falling away in an alarming manner, but the mules seem to require the stimulus of distention, and nothing else : this the dry grass affords.

On the march, about sunset, the Wattayah (twin hills) rose suddenly to view, south 75 deg. west ; and then Pike's peak, 20 or 30 degrees farther to north. At the same time the dim outline of the great spine of the Rocky mountain chain began to show itself.—We were now crossing the dividing line between the waters of the Timpas and those of the Purgatory, or Los Animos, of the Spaniards.

The vegetation was the same as that of yesterday, as far as we could judge from its burned and parched condition.

August 5.—To-day we descended eleven and a half miles, and reached the valley of the Purgatory, called by the mountain men, Picatoire, a corruption of Purgatoire, a swift running stream, a few yards in width, but no grass of any amount at the crossing.—The blighted trunks of large cotton-wood and locust

trees were seen for many miles along its course, but the cause of decay was not apparent.

The growth of the bottom, which is very narrow, was black locust, the everlasting cotton-wood, willow, wild currants, hops, plum and grape, artemisia, clematis Virginiana, salix in many varieties, and a species of angelica, but no fruit was on the bushes. Beyond this stream five and a half miles, we encamped on the bed of a tributary to the Purgatory, which comes down from the north side of the Raton, or Mouse, which is the name given to a chain of ragged-looking mountains that strikes the course of the Purgatory nearly at right angles, and separates the waters of the Arkansas from those of the Canadian. The banks of the Purgatory, where this stream debouches, begin to assume something of a milder aspect, different from scenery in the States. The hills are bare of vegetation, except a few stunted cedars; and the valley is said to be occasionally the resort of grisly bears, turkeys, deer, antelopes, &c.

Passing the rear-waggons of the infantry, we found their horses almost worn out, and the train followed by wolves.

Captain Cook, of the 1st dragoons, was sent ahead the day before yesterday, to sound Armijo. Mr. Liffendorfer, a trader, married to a Santa Fe lady, was sent in the direction of Taos, with two Pueblo Indians, to feel the pulse of the Pueblos and the Mexican people, and, probably, to buy wheat if any could be purchased, and to distribute the proclamations of the colonel commanding.

Yesterday, William Bent and six others, forming a spy-guard, were sent forward to reconnoitre the mountain passes. In this company was Mr. F. P. Blair, jun., who had been in this country some months for the benefit of his health.

Measured 13 double altitudes of Polaris, in the north, for latitude, and 7 of Aquila, in the east, for

local time, and the resulting latitude is 37 deg. 12 min. 10 sec., and longitude 6h. 56m. 48s. The height indicated by the barometer is 5,896 feet.

August 6.—Colonel Kearny left Colonel Doniphan's regiment and Major Clarke's artillery at our old camp-ground of last night, and scattered Sumner's dragoons three or four miles up the creek, to pass the day in renovating the animals by nips at the little bunches of grass spread at intervals in the valleys. This being done, we commenced the ascent of the Raton, and, after marching seventeen miles, halted with the infantry and general staff, within a half mile of the summit of the pass. Strong parties were sent forward to repair the road, which winds through a picturesque valley, with the Raton towering to the left. Pine-trees here obtain a respectable size, and lined the valley through the whole day's march. A few oaks (*Quercus Olivaformis*), big enough for axles, were found near the halting-place of to-night. When we first left the camp this morning, we saw several clumps of the pinon (*Pinus edulis*). It bears a resinous nut, eaten by Mexicans and Indians. We found also the Lamita in great abundance. It resembles the wild currant, and is, probably, one of its varieties; grows to the height of several feet, and bears a red berry, which is gathered, dried, pounded, and then mixed with sugar and water, making a very pleasant drink, resembling currant cordial. We were unfortunate in not being able to get either the fruit or flower. Neither this plant, the pinon, nor any of the plum-trees, nor grape vines, had any fruit on them, which is attributable to the excessive drought. The stream, which was last year a rushing torrent, is this year dry, and in pools.

The view from the camp is inexpressibly beautiful, and reminds persons of the landscapes of Palestine.

The rocks of the mountain were chiefly a light

sandstone, in strata, not far from horizontal : and the road was covered with many fragments of volcanic rocks, of purplish brown colour, porous, and melting over a slow fire.

The road is well located. The general appearance is something like the pass at the summit of the Boston and Albany railroad, but the scenery bolder, and less adorned with vegetation.

An express returned from the spy-guard, which reported all clear in front. Captain Cook and Mr. Liffendorfer have only reached the Canadian river. It was reported to me that, at Captain Summer's camp, about seven miles above where we encamped last night, and twelve miles from the summit, an immense field of coal crops out; the seam being 30 feet deep. To-night our animals were refreshed with good grass and water.

Nine observations on Polaris give for the latitude of the place 37 deg. 00 min. 21 sec.

Seven on Arcturus, in the west, and 7 on Alpha Aquilæ, in the east, give the chronometric longitude 6h. 57m. 01.35s.

Height above the sea, 7,169 feet.

August 7, camp 36.—We recommenced the ascent of the Raton, which we reached with ease, with our waggons, in about two miles. The height of this point above the sea, as indicated by the barometer, is 7,500 feet. From the summit we had a beautiful view of Pike's peak, the Wattayah, and the chain of mountains running south from the Wattayah. Several large white masses were discernible near the summits of the range, which we at first took for snow, but which on examination with the telescope, were found to consist of white limestone, or granular quartz, of which we afterwards saw so much in this country. As we drew near, the view was no less imposing. To the east rose the Raton, which appeared still as high as from the camp, 1,500 feet

below. On the top of the Raton the geological formation is very singular, presenting the appearance of a succession of castles. As a day would be required to visit it, I was obliged to forego that pleasure, and examine it merely with the glass. The mountain appears to be formed chiefly of sandstone, disposed in strata of various shades of colour, dipping gently to the east, until you reach near the summit, where the castellated appearance commences, the sides become perpendicular, and the seams vertical. The valley is strewed with pebbles and fragments of trap rock, and the fusible rock described yesterday, cellular lava, and some pumice.

For two days our way was strewed with flowers; exhilarated by the ascent, the green foliage of the trees in striking contrast with the deserts we had left behind, they were the most agreeable days of the journey.

There is said to be a lake, about ten miles to the east of the summit, where immense hordes of deer, antelope, and buffalo congregate, but may be doubted.

The descent is much more rapid than the ascent, and, for the first few miles, through a valley of good burned grass and stagnant waters, containing many beautiful flowers. But frequently you come to a place where the stream (a branch of the Canadian) has worked itself through the mountains, and the road has to ascend and then descend a sharp spur. Here the difficulties commence; and the road, for three or four miles, is just passable for a waggon; many of the train were broken in the passage. A few thousand dollars judiciously expended here, would be an immense saving to the government, if the Santa Fe country is to be permanently occupied, and Bent's Fort road adopted. A few miles from the summit we reached a wide valley where the mountains open out, and the inhospitable looking hills recede to a respectable distance to the right and left. Sixteen

miles from camp 36 brought us to the main branch of the Canadian, a slow running stream, discharging a volume of water the thickness of a man's waist. We found here Bent's camp. I dismounted under the shade of a cotton-wood, near an ant-hill, and saw something black which had been thrown out by the busy little insects ; and, on examination, found it to be bituminous coal, lumps of which were afterwards found thickly scattered over the plain. After crossing the river, and proceeding about a mile and a quarter, I found the party from which I had become separated encamped on the river, with a plentiful supply of grass, wood, and water ; and here we saw, for the first time, a few sprigs of the famous grama, (*Atheropogon Oligostachyum.*)

The growth on to-day's march was pinon in small quantities, scrub oak, scrub pine, a few lamita bushes, and on the Canadian, a few cotton-wood trees ; except at the camp, there was little or no grass. The evening threatened rain, but the clouds passed away, and we had a good night for observations. We have had no rain since we left Cow creeks, thirty days ago.

We are now in what may be called the paradise of that party of the country between Bent's Fort and San Miguel ; and yet he who leaves the edge of the Canadian or its tributaries must make a good day's march to find wood, water, or grass.

There may be mineral wealth in these mountains, but its discovery must be left to some explorer not attached to the staff of any army making forced marches into an enemy's country.

To-day commenced our half-rations of bread ; though not suffering for meat, we are anxious to seize on Santa Fe and its stock of provisions as soon as possible.

August 8.—We remained in camp all day to allow Colonel Doniphan's regiment and the artillery to come up. During the day, we had gusts of wind,

and clouds discharging rain to the west. Captain Sumner drilled his three squadrons of dragoons, and made quite an imposing show.

The latitude of the camp is 36 deg. 47 min. 34 sec. ; the longitude 6h. 56m. 59.7s.

On the 7th, I measured 8 altitudes of Arcturus in the west, and 8 of Alpha Aquilæ in the east ; and on the 8th, 10 of Arcturus and 8 of Alpha Aquilæ—showing the rate of chronometer 783 to be losing 3s. per day.

The height determined approximately, is 6,112 feet above the sea.

August 9.—We broke up camp at half-past two o'clock, and marched with the colonel's staff and the first dragoons 10½ miles, and encamped under the mountains on the western side of the Canadian, on the banks of a small stream, a tributary of the Canadian. The grass was short, but good ; the water in small quantities, and in puddles. Here we found a trap-dyke, course north 83° west, which shows itself also on the Canadian, about four miles distant, in the same course.

At the distance of six miles from last night's camp, the road forks—one branch running near the mountains to the west, but nearly parallel to the old road, and never distant more than four miles, and almost all the time in sight of it. The army was divided—the artillery, infantry, and waggon-train ordered to take the lower, and the Missouri volunteers and first dragoons the upper road. The valley here opens out into an extensive plain, slightly rolling, flanked on each side by ranges of perpendicular hills, covered with stunted cedar and the pinon. In this extensive valley or plain may be traced by the eye, from any of the neighbouring heights, the valleys of the Canadian and its tributaries, the Vermejo, the troops of antelopes, horses, deer, &c ; cacti in great abundance, and in every variety ; also, a plant which Dr. De

Camp pointed out as being highly balsamic; having collected quantities of it during his campaign to the Rocky mountains, and tested its efficacy as a substitute for balsam copaiba.

To-night we observed a great number of insects, the first remarked since leaving the Arkansas. Birds were equally rare, with the exception of the cow-bunting, which has been seen in great numbers on the whole route, and in a state so tame as to often alight on our horses. The horned frog (*Agama Cornuta*) also abounds here, as well as on the route westward from Chouteau's island.

August 10.—Colonel Kearney was dissatisfied with the upper road, and determined to strike for the old road. We did so after reaching the Vermejo 9 miles in a diagonal line, and rejoined it at the crossing of the Little Cimarron, where we found the infantry encamped—total distance $20\frac{1}{2}$ miles. The grass good, and water plenty, though not flowing. Another trap-dyke, parallel nearly to the last, and three miles distant, presented its wall-like front. It was strewed with fragments of feruginous sandstone and crystallized carbonate of lime.

A Mexican came into camp from Bent's Fort, and reported Lieutenant Albert much better. Colonel Kearney allowed him to pass to Taos, which place (60 miles distant by a bridle-path) he expected to reach to-night.

Five Mexicans were captured by Bent's spy company; they were sent out to reconnoitre our forces, with orders to detain all persons passing out of New Mexico. They were mounted on diminutive asses, and presented a ludicrous contrast by the side of the big men and horses of the first dragoons. Fitzpatrick, our guide, who seldom laughs, became almost convulsed whenever he turned his well-practised eye in their direction.

Mr. Towle, an American citizen, came to head-

quarters at the Vermejo, and reported himself just escaped from Taos. He brought the intelligence, that yesterday, the proclamation of Governor Armijo reached there, calling the citizens to arms, and placing the whole country under martial law; that Armijo has assembled all the Pueblo Indians numbering about 2,000, and all the citizens capable of bearing arms; that 300 Mexican dragoons arrived in Santa Fe the day Armijo's proclamation was issued, and that 1,200 more were hourly expected; that the Mexicans, to a man, were anxious for a fight, but that half the Pueblo Indians were indifferent on the subject, but would be made to fight.

A succession of thunder-storms passed yesterday to the north and west, but did not reach us. The ground indicates recent rain, as also does the grass, which looks as in the spring, just sprouting. The hills to the left, as near as I can judge, the same as in the Raton, were of different-coloured sandstone, regularly stratified, and dipping gently to the east, topped by a mural precipice of green stone. The growth on the mountains, pinon and cedar. On the plains, which are covered with scoriæ, scarcely a tree is to be seen. We encamped on the Little Cimarron, and observed at night for latitude and time. Seven altitudes of Polaris give for the latitude 36 deg. 27 min. 50 sec.; 7 on Arcturus in the west, and the same number on Alpha Aquilæ in the east, give the meridian by chronometer differences at 6h. 58m. 39s. Approximate height, 6,027 feet.

August 11.—We made a long march to-day with the advanced guard and the first dragoons, to the Ocate, $31\frac{1}{2}$ miles. The road approaches the Ocate, at the foot of a high bluff to the north, where the river runs through a canon, making it inaccessible to animals. We ascended the river for four or five miles, to where the road crosses; there we left the road, and at that point, the river being dry, continued

to ascend it a mile, and found good grass, and, occasionally, running water. The scenery to-day was very pretty, sometimes approaching to the grand; the road passed through a succession of valleys, and crossed numerous "divides" of the Rayada and Ocate. The Rayada is a limpid running stream, ten miles from the Little Cimarron, the first of the kind noted, though we have been traversing the bases of many mountains for days past. The pasture, however, is not good. At points two and four miles farther, at the foot of the mountains, there are springs and good grass. At the last point we overtook the infantry, where they halted. About five miles before reaching the Ocate, the road descends into a valley, overhung by confused and rugged cliffs, which give promise of grass and water; but, on going down, we found that this beautiful valley had no outlet, but terminated in a salt lake. The lake is now dry, and the bed is white with a thin saline incrustation. Here the road is indistinct, and takes a sudden turn to the left. At this moment we discovered coming towards us, at full speed, Bent's spy-guard. All thought they had met the enemy; I was ordered to ride forward to meet them, followed by Mr. Fitzpatrick and two dragoons. It proved to be a false alarm; they had missed their road, and were galloping back to regain it.

The hills are composed principally of basalt, and a porous volcanic stone, very hard, with metallic fracture and lustre, traversed by dykes of trap. The lava is underlaid by sandstone. From the uniform height of these hills, one would think they originally formed the table-land, and that the valleys had been formed by some denuding process, and their limits determined by the alternate existence or non-existence of the hard crust of volcanic rocks.

Matters are now becoming very interesting. Six or eight Mexicans were captured last night, and on

their persons were found the proclamation of the Prefect of Taos, based upon that of Armijo, calling the citizens to arms, to repel the "Americans, who were coming to invade their soil, and destroy their *property and liberties*;" ordering an enrolment of all citizens over fifteen and under fifty. It is decidedly less bombastic than any Mexican paper I have yet seen. Colonel Kearney assembled these prisoners, altogether some ten or twelve, made a speech to them, and ordered that, when the rear-guard should have passed, they should be released. These men were not deficient in form or stature; their faces expressed good-nature, bordering on idiocy; they were mounted on little donkies or jennies, guided by clubs instead of bridles.

Two more Mexicans, of a better class, were captured to-night, or rather they came into camp. Their story was, that they had come out by order of the alcalde of the Moro town, to look out for their standing enemies, the Eutaws, who were reported in the neighbourhood. That they had heard of our advance some time since, but believed us to be at the Rayada, twenty-two miles back; but seeing our waggons, and having faith in the Americans, they rode without hesitation into the camp. When they said they had faith in us, the colonel ordered them to shake hands with him. They were ordered to be detained for a day or two, for it was quite evident to all they were spies, who had come too suddenly into the little ravine in which we were encamped.

They appeared well pleased, and one of them, after proceeding a few steps with the guard, turned back and presented the colonel with a fresh cream cheese.

The grass was interspersed with a great variety of new and beautiful flowers, &c., &c. The hills were sparsely covered with cedar and pinon. Antelopes

and horned frogs in abundance, but no other animals were seen.

Height of this camp 6,946 feet.

August 12.—The elder Mexican was discharged, giving him two proclamations; one for the alcalde, another for the people of his town. A message was sent to the alcalde to meet us at the crossing of the Moro, with several of his chief men. The other Mexican was retained as a guide. About 12 o'clock the advance was sounded, and the colonel, with Sumner's command, marched 20 miles, and halted in a beautiful valley of fine grass and pools of cool water, where the wild liquorice (*Glycyrrhiza Lepidota*) grew plentifully. The stream, where flowing, is a tributary of the Moro.

From the drift-wood, &c., found in its well-grassed bed, I infer it is subject to great freshets. In crossing from the Ocate to the valley of the Moro, the mountains become more rolling; and as we approached the Moro, the valley opened out, and the whole country became more tame in its appearance.

Ten miles up the Moro is the Moro town, containing, we were informed, 200 houses.

It is off the lower road; but a tolerable waggon road leads to the village from our camp of last night.

The plains were strewed with fragments of brick-dust coloured lava, scoriæ and slag; the hills, to the left, capped with white granular quartz. The plains are almost destitute of vegetation; the hills bear a stunted growth of pinon and red cedar. Rains have fallen here recently, and the grass in the bottoms is good. The grama is now found constantly. We saw to-day some ground squirrels, with stripes on their sides: in their habits resembling the common prairie dog. A flight of birds was seen to the south, but too distant to distinguish. We were attracted to the left by an object which was supposed to be an Indian, but, on coming up to it, it was dis-

covered to be a sandstone block standing on end and topped by another shorter block. A mountain man, versed in these signs, said it was in commemoration of a talk and a friendly smoke between some two or three tribes of Indians.

The latitude of the place, from seven observations on Polaris, is 35 deg. 54 min. 21 sec. and the longitude, deduced from the local time by 7 altitudes of Alpha Lyrae in the west, and 11 of the sun in the east, was 6h. 59m. 49s.

The height above the sea 6,670 feet.

August 13.—At 12 o'clock, as the rear column came in sight, the call of "boots and saddles" was sounded, and in 20 minutes we were off. We had not advanced more than one mile when Bent, of the spy-guard, came up with four prisoners. They represented themselves to be an ensign and three privates of the Mexican army, sent forward to reconnoitre and ascertain our force. They said 600 men were at the Vegas to give us battle. They told many different stories; and finally delivered up a paper, being an order from a Captain Gonzales to the ensign, to go forward on the Bent's Fort road to ascertain our position and numbers. They were cross-examined by the colonel, and detained.

As soon as we commenced the descent into the valley of the Moro creek, some one reported a company of Mexicans at the crossing; Colonel Kearny ordered me to go forward with twelve of the Laclede rangers, and reconnoitre the party, and if they attempted to run, to pursue and capture as many as we could. As Lieutenant Elliot and myself approached this company, they appeared to be motionless, and on coming up, we found them to consist of nothing but the pine stakes of a corral. The dragoons were sadly disappointed; they evidently expected either a fight or a chase. Six miles brought us to the first settlement we had yet seen in 775 miles. The first

object I saw was a pretty Mexican woman, with clean white stockings, who very cordially shook hands with us and asked for tobacco. In the next house lived Mr. Boney, an American, who has been some time in this country, and is the owner of a large number of horses and cattle, which he manages to keep in defiance of wolves, Indians and Mexicans. He is a perfect specimen of a generous, open-hearted adventurer, and in appearance what, I have pictured to myself, Daniel Boone of Kentucky must have been in his day. He drove his herd of cattle into camp and picked out the largest and fattest, which he presented to the army.

Two miles below, at the junction of the Moro and Sapillo, is another American, Mr. Wells, of North Carolina; he has been here but six months, and barring his broad-brimmed sombrero, might have been taken for a serjeant of dragoons, with his blue pantaloons with broad gold-coloured stripes on the sides, and his jacket trimmed with lace. I bought butter from him at four bits the pound.

We halted at the Sapillo, distance nine and a half miles from our last night's encampment, in a tremendous shower of rain; the grass was indifferent, being clipped short by the cattle from the rancheria. Wood and water plenty.

At this place a Mr. Spry came into camp on foot, and with scarcely any clothing. He had escaped from Santa Fe on the night previous, at Mr. H——'s request, to inform Colonel Kearny that Armijo's forces were assembling, that he might expect vigorous resistance, and that a place called the canon, 15 miles from Santa Fe, was being fortified; and to advise the colonel to go round it.

The canon is a narrow defile, easily defended, and of which we have heard a great deal. War now seems "inevitable;" and the advantages of ground and numbers will, no doubt, enable the Mexicans to

make the fight interesting. The grass was miserable, and the camp ground inundated by the shower of to-day—which was quite a rarity.

August 14.—The order of march to-day was that which could easily be converted into the order of battle. After proceeding a few miles we met a queer cavalcade, which we supposed at first to be the looked for alcalde from Moro town, but it proved to be a messenger from Armijo; a lieutenant, accompanied by a sergeant and two privates, of Mexican lancers. The men were good looking enough, and evidently dressed in their best bib and tucker. The creases in their pantaloons were quite distinct, but their horses were mean in the extreme, and the contempt with which our dragoons were filled was quite apparent. The messenger was the bearer of a letter from Armijo. It was a sensible, straightforward missive, and if written by an American or Englishman, would have meant this: “You have notified me that you intend to take possession of the country I govern. The people of the country have risen, en masse, in my defence. If you take the country, it will be because you proved the strongest in battle. I suggest to you to stop at the Sapillo, and I will march to the Vegas. We will meet and negotiate on the plains between them.”

The artillery were detained some time in passing the Sapillo. This kept us exposed to the sun on the plains for four hours, but it gave the colonel time to reflect on the message with which he should dismiss the lancers; as there was some apprehension that Captain Cooke was detained, their discharge became matter for reflection. Sixteen miles brought us in sight of the Vegas, a village on the stream of the same name.

A halt was made at this point, and the colonel called up the lieutenant and lancers and said to them, “The road to Santa Fe, is now as free to you as to

myself. Say to General Armijo, I shall soon meet him, and I hope it will be as friends."

At parting, the lieutenant embraced the colonel, Captain Turner, and myself, who happened to be standing near.

The country to-day was rolling, almost mountainous, and covered in places with scoriae. Grass began to show itself, and was interspersed with *Malva Pedata*, and several new species of *Geraniaceæ*, *Bartonia*, and *Convolvulus*. The soil was good enough apparently, but vegetation was stunted from the want of rain. As we emerged from the hills into the valley of the Vegas, our eyes were greeted for the first time with waving corn. The stream was flooded, and the little drains by which the fields were irrigated, full to the brim. The dry soil seemed to drink it in with the avidity of our thirsty horses. The village, at a short distance, looked like an extensive brick-kiln. On approaching, its outline presented a square with some arrangements for defence. Into this square the inhabitants are sometimes compelled to retreat, with all their stock, to avoid the attacks of the Eutaws and Navajoes, who pounce upon them and carry off their women, children, and cattle. Only a few days since, they made a descent on the town and carried off 120 sheep and other stock. As Captain Cooke passed through the town some ten days since, a murder had just been committed on these helpless people. Our camp extended for a mile down the valley; on one side was the stream, on the other the corn-fields, with no fence or hedge interposing. What a tantalizing prospect for our hungry and jaded nags; the water was free, but a chain of sentinels was posted to protect the corn, and strict orders given that it should not be disturbed.

Captain Turner was sent to the village to inform the alcalde that the colonel wished to see him and

the head men of the town. In a short time down came the alcalde and two captains of militia, with numerous servants, prancing and careering their little nags into camp.

Observations.—9 altitudes of Polaris in the north, 7 of Arcturus in the east, and 7 of Alpha Aquilæ in the east.

Latitude 35 deg. 35 min. 05 sec.

Longitude 7h. 00m. 46s.

Height, by the barometer, 6,418 feet.

August 15.—12 o'clock last night information was received that 600 men had collected at the pass which debouches into the Vegas, two miles distant, and were to oppose our marching. In the morning, orders were given to prepare to meet the enemy. At 7, the army moved, and just as we made the road leading through the town, Major Swords, of the quartermaster's department, Lieutenant Gilmer, of the engineers, and Captain Weightman, joined us, from Fort Leavenworth, and presented Colonel Kearny with his commission as brigadier-general in the army of the United States. They had heard we were to have a battle, and rode six miles during the night to be in it.

At eight, precisely, the general was in the public square, where he was met by the alcalde and people, many of whom were mounted; for these people seem to live on horseback.

The general pointed to the top of one of their houses, which are built of one story, and suggested to the alcalde that if he would go to that place, he and his staff would follow, and, from that point, where all could hear and see, he would speak to them; which he did, as follows:

"Mr. Alcalde, and people of New Mexico: I have come among you by the orders of my government, to take possession of your country, and extend over it the laws of the United States. We

consider it, and have done so for some time, a part of the territory of the United States. We come amongst you as friends—not as enemies; as protectors—not as conquerors. We come among you for your benefit—not for your injury.

"Henceforth I absolve you from all allegiance to the Mexican government, and from all obedience to General Armijo. He is no longer your governor. [Great sensation]. I am your governor. I shall not expect you to take up arms and follow me, to fight your own people, who may oppose me; but I now tell you, that those who remain peaceably at home, attending to their crops and their herds, shall be protected by me, in their property, their persons, and their religion; and not a pepper, not an onion shall be disturbed or taken by my troops without pay, or by the consent of the owner. But listen! he who promises to be quiet, and is found in arms against me, I will hang!

"From the Mexican government you have never received protection. The Apaches and the Navajoes come down from the mountains and carry off your sheep, and even your women, whenever they please. My government will correct all this. It will keep off the Indians, protect you in your persons and property; and, I repeat again, will protect you in your religion. I know you are all great Catholics; that some of your priests have told you all sorts of stories—that we would ill-treat your women, and brand them on the cheek as you do your mules on the hip. It is all false. My government respects your religion as much as the Protestant religion, and allows each man to worship his Creator as his heart tells him is best. Its laws protect the Catholic as well as the Protestant; the weak as well as the strong; the poor as well as the rich. I am not a Catholic myself—I was not brought up in that faith; but, at least one-

third of my army are Catholics, and I respect a good Catholic as much as a good Protestant.

"There goes my army—you see but a small portion of it; there are many more behind—resistance is useless.

"Mr. Alcalde, and you two captains of militia, the laws of my country require that all men who hold office under them shall take the oath of allegiance. I do not wish, for the present, until affairs become more settled, to disturb your form of government. If you are prepared to take the oath of allegiance, I shall continue you in office, and support your authority."

This was a bitter pill; but it was swallowed by the discontented captain, with downcast eyes. The general remarked to him, in hearing of all the people "Captain, look me in the face, while you repeat the oath of office." The hint was understood—the oath taken, and the alcalde and the two captains pronounced to be continued in office. The people were enjoined to obey the alcalde, &c., &c. The citizens grinned, and exchanged looks of satisfaction, but seemed not to have the boldness to express what they evidently felt—that their burdens, if not relieved, were, at least, shifted to some ungalled part of the body.

We descended by the same rickety ladder by which we had climbed to the tops of the houses, mounted our horses and rode briskly forward to encounter our 600 Mexicans in the gorge of the mountains, two miles distant.

The sun shone with dazzling brightness; the guidons and colours of each squadron, regiment, and battalion, were for the first time unfurled. The drooping horses seemed to take courage from the gay array. The trumpeters sounded "to horse," with spirit, and the hills multiplied and re-echoed the call. All wore the aspect of a gala day; and as we ap-

proached the gorge, where we expected to meet the enemy, we broke into a brisk trot, and then into a full gallop, preceded by a squadron of horse. The gorge was passed, but no person seen.

One by one the guidons were furled; the men looked disappointed, and a few minutes found us dragging our slow lengths along with the usual indifference in regard to every subject, except that of overcoming space.

Two miles further brought us to another pass, as formidable as the first, and all the intermediate country was broken, and covered with a dense growth of pine, pinon, and cedar. Here the mountains began to rise to the height of a thousand feet above the road. Nine miles more brought us to Tacolete.

Here we met the alcalde and the people, in the cool and spacious residence of the former, where the drama, just described, was again enacted. This time it was graced by the presence of the women, with their bare ankles, round, plump arms, and slippers feet.

We marched ten miles further, to the Vernal springs, and halted at the upper spring, and observed for time and latitude about 500 feet south of the upper spring.

Observed 9 altitudes of Polaris, 7 of Alpha Aquilæ, and 7 of Arcturus. Latitude 35 deg. 23 min. 19 sec. longitude 7h. 01m. 23s.

Height indicated by the barometer, 6,299 feet.

August 16.—We marched to San Miguel, where General Kearny assembled the people and harangued them much in the same manner as at the Vega.

Reports now reached us at every step that the people were rising, and that Armijo was collecting a formidable force to oppose our march at the celebrated pass of the canon, 15 miles from Santa Fe. About the middle of the day's march the two Pueblo Indians, previously sent in to sound the chief men

of that formidable tribe, were seen in the distance, at full speed, with arms and legs both thumping into the sides of their mules at every stride. Something was now surely in the wind. The smaller and foremost of the two dashed up to the general, his face radiant with joy, and exclaimed, "They are in the Canon, my brave ; pluck up your courage and push them out." As soon as his extravagant delight at the prospect of a fight, and the pleasure of communicating the news had subsided, he gave a pretty accurate idea of Armijo's force and position.

The road passed over to-day was good, but the face of the country exceedingly rugged, broken, and covered with pinon and cedar. To the left, one or two miles distant, towers a wall nearly perpendicular, 2,000 feet high, apparently level at top, and showing, as near as I could judge from the road, an immense stratum of red earth.

We turned from the road to the creek, where there were a few rancherias, to encamp ; at which place we passed an uncomfortable night, the water being hard to reach, and the grass very bad.

Barometric height 6,346 feet.

August 17.—The picquet guard, stationed on the road, captured the son of Saliza, who, it is said, is to play an important part in the defence of this country, and the same who behaved so brutally to the Texan prisoners. The son was at San Miguel yesterday, and heard from a concealed place all that passed. It is supposed, at this time, he was examining the position, strength, &c., of our army, to report to his father.

A rumour has reached camp that 2,000 Mexicans assembled in the Canon to oppose us, have quarrelled among themselves ; that Armijo, taking advantage of the dissensions, fled with his dragoons and artillery to the south. He has long been suspected of wishing an excuse to fly. It is well known he

has been averse to a battle, but some of his people threatened his life if he refused to fight. He has been, for some days, more in fear of his own people than of the American army. He has seen what they are blind to ; the hopelessness of resistance.

As we approached the ruins of the ancient town of Pecos, a large fat fellow, mounted on a mule, came towards us at full speed, and extending his hand to the general, congratulated him on the arrival of himself and army. He said, with a roar of laughter, "Armijo and his troops have gone to hell, and the Canon is all clear." This was the alcalde of the settlement, two miles up the Pecos from the ruins, where we encamped, 15½ miles from our last camp, and two miles from the road.

Pecos, once a fortified town, is built on a promontory or rock, somewhat in the shape of a foot. Here burned, until within seven years, the eternal fires of Montezuma, and the remains of the architecture exhibit, in a prominent manner, the ingraftment of the Catholic church upon the ancient religion of the country. At one end of the short spur forming the terminus of the promontory, are the remains of the "*estuffa*," with all its parts distinct : at the other are the remains of the Catholic church, both showing the distinctive marks and emblems of the two religions. The fires from the "*estuffa*" burned and sent their incense through the same altars from which was preached the doctrine of Christ. Two religions so utterly different in theory, were here, as in all Mexico, blended in harmonious practice until about a century since, when the town was sacked by a band of Indians.

Amidst the havoc of plunder of the city the faithful Indian managed to keep his fire burning in the "*estuffa*;" and it was continued till a few years since —the tribe became almost extinct. Their devotions rapidly diminished their numbers, until they became

so few as to be unable to keep their immense estuffa (forty feet in diameter) replenished, when they abandoned the place and joined a tribe of the original race over the mountains, about sixty miles south. There, it is said, to this day they keep up their fire, which has never yet been extinguished. The labour, watchfulness, and exposure to heat consequent on this practice of their faith, is fast reducing this remnant of the Montezuma race ; and a few years will, in all probability, see the last of this interesting people. The remains of the modern church, with its crosses, its cells, its dark mysterious corners and niches, differ but little from those of the present day in New Mexico. The architecture of the Indian portion of the ruins presents peculiarities worthy of notice.

Both are constructed of the same materials ; the walls of the sun-dried brick, the rafters of well-hewn timber, which could never have been hewn by the miserable little axes now used by the Mexicans, which resemble, in shape and size, the wedges used by our farmers for splitting rails. The cornices, and drops of the architrave in the modern church, are elaborately carved with a knife.

To-night we found excellent grass on the Rio Pecos, abreast of the ruins where the modern village of Pecos is situated, with a very inconsiderable population.

August 18.—We were this morning twenty-nine miles from Santa Fe. Reliable information, from several sources, had reached camp yesterday and the day before, that dissensions had arisen in Armijo's camp, which had dispersed his army, and that he had fled to the south, carrying all his artillery, and one hundred dragoons with him. Not a hostile rifle or arrow was now between the army and Santa Fe, the capital of New Mexico, and the general determined to make the march in one day, and raise the United

States flag over the palace before sundown. New horses or mules were ordered for the artillery, and everything was braced up for a forced march. The distance was not great, but the road bad, and the horses on their last legs.

A small detachment was sent forward at daybreak, and at six the army followed. Four or five miles from old Pecos the road leads into a canon, with hills on each side from 1,000 to 2,000 feet above the road, in all cases within cannon shot, and in many within point-blank musket shot; and this continues to a point but 12 or 15 miles from Santa Fe.

The scenery is wild; the geological formation much the same as before described, until you begin to descend towards the Del Norte, when granitic rocks and sands are seen in great abundance on the road as far as Santa Fe. Cedar, pinon and a large growth of long-leaved pine, are densely crowded wherever the rock affords a crevice, until within six or eight miles of the town. Fifteen miles from Santa Fe we reached the position deserted by Armijo. It is a gateway which, in the hands of a skilful engineer and one hundred resolute men, would have been perfectly impregnable.

Had the position been defended with any resolution, the general would have been obliged to turn it by a road which branches to the south, six miles from Pecos, by way of Galisteo.

Armijo's arrangements for defence were very stupid. His abbatis were placed behind the gorge some 100 yards, by which he evidently intended that the gorge should be passed before his fire was opened.—This done, and his batteries would have been carried without difficulty.

Before reaching the canon, the noon halt was made in a valley covered with some grama, and the native potato in full bloom. The fruit was not quite as large as a wren's egg. As we approached the

town, a few straggling Americans came out, all looking anxiously for the general, who, with his staff, was clad so plainly, that they passed without recognising us. Another officer and myself were sent down to explore the by-road by which Armijo fled. On our return to the main road, we saw two Mexicans; one the acting secretary of state, in search of the general. They had passed him without knowing him. When we pointed in the direction of the general, they broke into a full run, their hands and feet keeping time to the pace of their nags. We followed in a sharp trot, and, as we thought, at a respectful distance. Our astonishment was great to find, as they wound through the ravine through the open well-grown pine forest, that they did not gain on us perceptibly. "Certainly they are in a full run, and as certainly we are only in a trot," we both exclaimed. I thought we were under some optical delusion, and turned to my servant to see the pace at which he was going. "Ah!" said he, "those Mexican horses make a mighty great doing to no purpose." That was a fact; with their large cruel bits, they harass their horses into a motion which enables them to gallop very long without losing sight of the starting-place.

The acting secretary brought a letter from Vigil, the lieutenant-governor, informing the general of Armijo's flight, and of his readiness to receive him in Santa Fe, and extend to him the hospitalities of the city. He was quite a youth, and dressed in the fashion of the Americans. Here, all persons from the United States are called Americans, and the name is extended to no other race on the continent.

To-day's march was very tedious and vexatious; wishing to enter Santa Fe in an imposing form, frequent halts were made to enable the artillery to come up. Their horses almost gave out, and during the

day mule after mule was placed before the guns; until scarcely one of them was spared.

The head of the column arrived in sight of the town about three o'clock; it was six before the rear came up. Vigil and twenty or thirty people of the town received us at the palace, and asked us to partake of some wine and brandy of domestic manufacture. It was from the Passo del Norte; we were too thirsty to judge of its merits; anything liquid and cool was palatable. During the repast, and as the sun was setting, the United States flag was hoisted over the palace, and a salute of thirteen guns fired from the artillery planted on the eminence overlooking the town.

The ceremony ended, we were invited to supper at Captain —'s, a Mexican gentleman, formerly in the army. The supper was served very much after the manner of a French dinner, one dish succeeding another in endless variety. A bottle of good wine from the Passo del Norte, and a loaf of good bread was placed at each plate. We had been since five in the morning without eating, and inexhaustible as were the dishes was our appetite.

August 19.—I received an order to make a reconnaissance of the town, and select a site for a fort, in co-operation with Lieutenant Gilmer, of the engineers. This occupied me diligently on the 19th and 20th, and on the 21st the general was furnished with the map, a copy of which is sent to the adjutant-general, and another to the Bureau of Topographical Engineers.

The site selected and marked on the map is within 600 yards of the heart of the town, and is from 60 to 100 feet above it. The contour of the grounds is unfavourable for the trace of a regular work, but being the only point which commands the entire town, and which is itself commanded by no other, we did not hesitate to recommend it. The recom-

mendation was approved. On the 22d we submitted a complete plan of the work, which was also approved. It is computed for a garrison of 280 men.

On the 23rd, the work was commenced with a small force; on the 27th, a hundred labourers were set to work on it, detailed from the army, and, on the 31st, twenty Mexican masons were added.

As it was determined to send an express to the States on the 25th, I commenced to project and plot my map of the route of the Army of the West, that the government might have at once the benefit of my labours. It was rather a bold undertaking to compress, in a few days, the work of months. My astronomical observations were brought up from day to day, as we advanced on the march, without which the undertaking would have been impracticable. We all worked day and night, and, with the assistance of several gentlemen of the volunteers, I succeeded in accomplishing the work; not, however, in a very satisfactory manner.

Events now begin to crowd on each other in quick succession, but my duties keep me so constantly occupied in my office and in the field, that I cannot chronicle them in regular order or enter much upon details. On the morning of the 19th, the general assembled all the people in the plaza, and addressed them at some length.

The next day, the chiefs and head men of the Pueblo Indians came to give in their adhesion and express their great satisfaction at our arrival. This large and formidable tribe are amongst the best and most peaceable citizens of New Mexico. They, early, after the Spanish conquest, embraced the forms of religion, and the manners and customs of their then more civilized masters, the Spaniards. They narrated, what is a tradition with them, that the white man would come from the far east and release them from the bonds and shackles which the

Spaniards had imposed, not in the name, but in a worse form than slavery.

They and the numerous half-breeds are our fast friends now and for ever. Three hundred years of oppression and injustice have failed to extinguish in this race the recollection that they were once the peaceable and inoffensive masters of the country.

A message was received the same night from Armijo, asking on what terms he would be received; but this proved to be only a ruse on his part to gain time in his flight to the south. Accounts go to show that his force at the Canon was 4,000 men, tolerably armed, and six pieces of artillery. Had he been possessed of the slightest qualifications for a general, he might have given us infinite trouble. A priest arrived last night, the 29th, and brought the intelligence that at the moment of Armijo's flight, Urgarte, a colonel in the regular service, was on his march, at this side of the Passo del Norte, with 500 men to support him. That, had he continued, he would have been enabled to rouse the whole southern district, which is by far the wealthiest and most populous of the whole country.

In the course of the week, various deputations have come in from Taos, giving in their allegiance and asking protection from the Indians. That portion of the country seems the best disposed towards the United States. A Taos man may be distinguished at once by the cordiality of his salutation.*

A band of Navojoes, naked, thin, and savage-looking fellows, dropped in and took up their quarters with Mr. Robideaux, our interpreter, just opposite my quarters. They ate, drank, and slept all the time, noticing nothing but a little cinnamon-coloured, naked brat, that was playing in the court, which they gazed at with the eyes of gastronomers.

* Since this was written, the massacre of the excellent Governor Bent has taken place in Taos. It proves the profound duplicity of the race.

Various rumours have reached us from the south that troops are moving on Santa Fe, that the people are rising, &c. To quiet them, an expedition of 150 miles down the river has been determined on, to start on the 1st of September.

August 30.—To day we went to church in great state. The governor's seat, a large, well-stuffed chair, covered with crimson, was occupied by the commanding officer. The church was crowded with an attentive audience of men and women, but not a word was uttered from the pulpit by the priest, who kept his back to the congregation the whole time, repeating prayers and incantations. The band, the identical one used at the fandango, and strumming the same tunes, played without intermission. Except the governor's seat and one row of benches, there were no seats in the church. Each woman dropped on her knees on the bare floor as she entered, and only exchanged this position for a seat on the ground at long intervals, announced by the tinkle of a small bell.

The interior of the church was decorated with some fifty crosses, a great number of the most miserable painting and wax-figures, and looking-glasses trimmed with pieces of tinsel.

The priest, a very grave, respectable looking person, of fair complexion, commenced the service by sprinkling holy water over the congregation ; when abreast of any high official person he extended his silver waterspout and gave him a handful.

When a favourite air was struck up, the young women, whom we recognized as having figured at the fandango, counted their beads, and crossed themselves to the time of the music.

All appeared to have just left their work to come to church. There was no fine dressing nor personal display that will not be seen on week days. Indeed, on returning from church, we found all the stores open,

and the market women selling their melons and plums as usual.

The fruits of this place, musk-melon, apples, and plums, are very indifferent, and would scarcely be eaten in the States. I must except, in condemning their fruit, the apricots and grapes, which grow in perfection. On leaving the narrow valley of the Santa Fe, which varies from a thousand feet to a mile or two in width, the country presents nothing but barren hills, utterly incapable, both from soil and climate, of producing any thing useful.

The valley is entirely cultivated by irrigation, and is now covered with corn. Five miles below the town, the stream disappears in the granitic sands.

The population of Santa Fe is from two to four thousand, and the inhabitants are, it is said, the poorest people of any town in the province. The houses are of mud bricks, in the Spanish style, generally of one story, and built on a square. The interior of the square is an open court, and the principal rooms open into it. They are forbidding in appearance from the outside, but nothing can exceed the comfort and convenience of the interior. The thick walls make them cool in summer and warm in winter.

The better class of people are provided with excellent beds, but the lower class sleep on untanned skins. The women here, as in many other parts of the world, appear to be much before the men in refinement, intelligence, and knowledge of the useful arts. The higher class dress like the American women, except, instead of the bonnet, they wear a scarf over the head, called reboso. This they wear, asleep or awake, in the house or abroad.

The dress of the lower class of women is a simple petticoat, with arms and shoulders bare, except what may chance to be covered by the reboso.

The men who have means to do so, dress after our

fashion ; but by far the greater number, when they dress at all, wear leather breeches, tight round the hips and open from the knee down ; shirt and blanket take the place of our coat and vest.

The city is dependent on the distant hills or wood, and at all hours of the day may be seen jackasses passing laden with wood, which is sold at two bits (twenty-five cents) the load. These are the most diminutive animals, and usually mounted from behind, after the fashion of leap-frog. The jackass is the only animal that can be subsisted in this barren neighbourhood without great expense ; our horses are all sent to a distance of twelve, fifteen, and thirty miles for grass.

Grain was very high when we first entered the town, selling freely at five and six dollars the fanegas, (one hundred and forty pounds). As our waggons draw near, and the crops of wheat are being gathered, the price is falling gradually to four dollars the fanegas.

Milk at six cents per pint, eggs three cents a-piece, sugar thirty-five cents per pound, and coffee seventy-five cents. The sugar used in the country is principally made from the cornstalk.

A great reduction must take place now in the price of dry goods and groceries, twenty per cent., at least, for this was about the rate of duty charged by Armijo, which is now, of course, taken off.

He collected fifty or sixty thousand dollars annually, principally, indeed entirely, on goods imported overland from the United States. His charge was 500 dollars the waggon load, without regard to the contents of the waggon or value of the goods, and hence the duty was very unjust and unequal.

Mr. Alvarez informed me that the importations from the United States varied very much, but that he thought they would average about half a million.

of dollars yearly, and no more. Most of the waggons go on to Chihuahua without breaking their loads.

New Mexico contains, according to the last census, made a few years since, 100,000 inhabitants. It is divided into three departments—the northern, middle, and south-eastern. These are again subdivided into counties, and the counties into townships. The lower or southern division is incomparably the richest, containing 48,000 inhabitants, many of whom are wealthy and in possession of farms, stock, and gold dust.

New Mexico, although its soil is barren, and its resources limited, unless the gold mines should, as is probable, be more extensively developed hereafter, and the culture of the grape enlarged, is, from its position, in a commercial and military aspect, an all-important military possession for the United States. The road from Santa Fe to Fort Leavenworth presents few obstacles for a railway, and, if it continues as good to the Pacific, will be one of the routes to be considered, over which the United States will pass immense quantities of merchandise into what may, become, in time, the rich and populous States of Sonora, Durango, and Southern California.

As a military position, it is important and necessary. The mountain fastnesses have long been the retreating places of the warlike parties of Indians and robbers, who sally out to intercept our caravans moving over the different lines of travel to the Pacific.

The latitude of Santa Fe, determined by 52 circum-meridian altitudes of Alpha Aquilæ, 23 of Beta Aquarii, and 36 altitudes of Polaris out of the meridian, is N. 35 deg. 44 min. 06 sec. The longitude, by the measurement of 8 distances between Alpha Aquilæ and the Moon, and 8 between Antares and the Moon, is respectively 7h. 04m. 14.7s. and 7h. 04m. 22.4s. The mean of which is 7h. 04m. 18s., and the longitude brought by the chronometer from

the meridian of Fort Leavenworth is 7h. 04m. 05.5s.

The place of observation was the court near the north-east corner of the public square. The latitude may be considered fixed; but satisfactory as the longitude may appear, I should, nevertheless, have greatly multiplied the number of lunar distances, had I not been in daily expectation of receiving a transit instrument, with which a set of observations on moon culminating stars could have been made at this important geographical point.

The mean of all the barometric readings at Santa Fe indicates, as the height of this point above the sea, 6,846 feet, and the neighbouring peaks to the north are many thousand feet higher.

August 31.—Lieutenant Warner arrived to-day, but cannot yet be relieved from ordnance duty. To-morrow an expedition goes to Taos, but, as Mr. Peck is sick, I have no officer to send with it. To-day apparently well authenticated accounts have arrived that Armijo met Ugarte, about 150 miles below, coming up with a force of 500 regulars and some pieces of artillery; that he turned back, and is now marching towards us with a large force, rallying the people as he passes, and that numbers are joining him from the upper towns. In consequence of these reports, the general has strengthened the force with which he is to march the day after to-morrow to meet him.

September 2.—We marched out of Santa Fe at 9 o'clock, A. M., taking no one of my party except Mr. Bestor, and leaving Lieutenant Peck, who is still an invalid, to assist Lieutenant Gilmer. We descended the valley of the Santa Fe river, nearly west, for five miles, when we left the river and struck across a dry arid plain intersected by arroyos, (dry beds of streams,) in a south-westerly course. Twenty-three miles brought us to the Galisteo creek, which, at that time, was barely running. The bed of the creek is

sand and pebbles of the primitive rock, and lies between steep clay and limestone, traversed occasionally by trap dykes, which in one place are so regular as to resemble a wall pierced with windows. From this place to its mouth there is scarcely the sign of vegetation. At the dry mouth of the Galisteo, and directly on the Del Norte, is the town of Santo Domingo. Before reaching Galisteo creek, but after leaving Santa Fe some miles, a few sprigs of grama tempted us to halt and bait our nags : but the principal growth on the plains was Ephedra, *Diotis lanata*, (Romeria of the Spaniards,) *hendecandra Texana*.

September 3.—This has been a great day. An invitation was received, some days since, from the Pueblo Indians, to visit their town of Santo Domingo. From height to height, as we advanced, we saw horsemen disappearing at full speed. As we arrived abreast of the town we were shown by a guide, posted there for the purpose, the road to Santo Domingo. The chief part of the command and the waggon train were sent along the highway ; the general with his staff and Captain Burguin's squadron of dragoons, wended his way along the bridle-path, nearly due west to the town. We had not proceeded far, before we met ten or fifteen sachemic looking old Indians, well mounted, and two of them carrying gold-headed canes with tassels, the emblems of office in New Mexico.

Salutations over, we jogged along, and, in the course of conversation, the alcalde, a grave and majestic old Indian, said, as if casually, "We shall meet some Indians presently, mounted, and dressed for war, but they are the young men of my town, friends come to receive you, and I wish you to caution your men not to fire upon them when they ride towards them,"

When within a few miles of the town, we saw a cloud

of dust rapidly advancing, and soon the air was rent with a terrible yell, resembling the Florida war-whoop. The first object that caught my eye through the column of dust, was a fierce pair of buffalo horns, overlapped with long shaggy hair. As they approached, the sturdy form of a naked Indian revealed itself beneath the horns, with shield and lance, dashing at full speed, on a white horse, which, like his own body, was painted all the colours of the rainbow: and then, one by one, his followers came on, painted to the eyes, their own heads and their horses covered with all the strange equipments that the brute creation could afford in the way of horns, skulls, tails, feathers, and claws.

As they passed us, one rank on each side, they fired a volley under our horses' bellies from the right and from the left. Our well-trained dragoons sat motionless on their horses, which went along without pricking an ear, or showing any sign of excitement.

Arrived in the rear, the Indians circled round, dropped into a walk on our flanks until their horses recovered breath, when off they went at full speed, passing to our front, and when there, the opposite files met, and each man selected his adversary and kept up a running fight, with muskets, lances, and bows and arrows. Sometimes a fellow would stoop almost to the earth to shoot under his horse's belly, at full speed, or to shield himself from an impending blow. So they continued to pass and repass us all the way to the steep cliff which overhangs the town. There they filed on each side of the road, which descends through a deep canon, and halted on the peaks of the cliffs. Their motionless forms projected against the clear blue sky above, formed studies for an artist. In the canon we were joined by the priest, a fat old white gentleman. We were escorted first to the padre's, of course: for here, as every

where, these men are the most intelligent, and the best to do in the world, and when the good people wish to put their best foot foremost, the padre's wines, beds, and couches have to suffer. The entrance to the portal was lined with the women of the village, all dressed alike, and arranged in treble files ; they looked fat and stupid.

We were shown into his reverence's parlour, tapestryed with curtains stamped with the likenesses of all the Presidents of the United States up to this time. The cushions were of spotless damask, and the couch covered with a white Navajoe blanket worked in richly coloured flowers.

The air was redolent with the perfumes of grapes and melons, and every crack of door and windows glistening with the bright eyes and arms of the women of the capilla. The old priest was busily talking in the corner, and little did he know of the game of signs carried on between the young fellows and the fair inmates of his house. We had our gayest array of young men out to-day, and the women seemed to me to drop their usual subdued look and timid wave of the eyelash for good hearty twinkles and signs of unaffected and cordial welcome—signs supplying the place of conversation, as neither party could speak the language of the other. This little exchange of the artillery of eyes was amusing enough, but I was very glad to see the padre moving towards the table, and remove the pure white napkins from the grapes, melons, and wine. We were as thirsty as dust and heat could make us, and we relished the wine highly, whatever its quality. The sponge-cake was irreproachable, and would have done honour to our best northern housekeepers. Indeed, wherever we have been feasted, the sponge-cake has been in profusion, and of the best kind. After the repast, the general went forward on the portal, and delivered a speech to the assembled people of the town, which

was first interpreted into Spanish, and then into Pueblo.

It is impossible to arrive at the precise population of the town, but I should judge it to be about six hundred, and the quantity of ground under tillage for their support about five hundred acres.

The valley of the Del Norte is here quite narrow, and the soil sandy. The river itself was viewed by me, for the first time, with a strange interest. The hardships, trials, and perseverance of the gallant Pike, and the adventures of the pious and brave soldiers of the cross, Rivera and La Ford, came forcibly to my mind; as I kneeled down to drink of its waters my thoughts were of them. Leaving Santo Domingo, we struck the highway in about four miles, and two more brought us to the pretty village of San Felipe, overhung by a steep craggy precipice, upon the summit of which are the ruins of a Roman Catholic church, presenting in the landscape sketch the appearance of the pictures we see of the castles on the Rhine.

Between San Felipe and the Angosturas, six miles below, the valley of the river is very narrow, affording no interval for agriculture. On the west side, the banks are steep walls, crowned by seams of basalt forming the table-lands. The east is composed of rolling sand-hills, rising gradually to the base of the mountains, and covered with large round pebbles. I must except from this the poverty-stricken little town of Algodones, which has some ground round it in cultivation.

September 4.—Below the Angosturas, the valley of the river opens into a plain, varying from two to six miles in width, generally sufficiently low and level to admit the water of the river to be carried over it for the purposes of irrigation; but the soil is very sandy and better adapted to Indian corn than wheat. Of this last we saw but few stubbles, the

ground being chiefly planted with corn. The vegetation is much the same as that described after leaving Santa Fe, with the addition of quite a number of compositæ.

News now began to arrive which left but little doubt that the reports which caused our movement down the river were exaggerated, if not wholly without foundation. People had passed down the river, as was reported, but in no great numbers. A messenger came in from the Alcalde of Tome with an official note, stating that Armijo had left with him one hundred mules, pressed into service to meet us at the canon, and that Armijo had also notified him that one hundred more would be left at the Paso del Norte. These belonged to citizens of New Mexico, and had been taken from them without their consent. It was his practice, in peace or in war, to seize the person or property of any who fell under his displeasure.

The town of Bernallilo is small, but one of the best built in the territory. We were here invited to the house of a wealthy man to take some refreshment. We were led into an oblong room, furnished like that of every Mexican in comfortable circumstances. A banquette runs around the room, leaving only a space for the couch. It is covered with cushions, carpets, and pillows; upon which the visitor sits or reclines. The dirt floor is usually covered a third or a half with a common-looking carpet. On the uncovered parts is the table, freighted with grapes, sponge-cake, and the wine of the country.—The wall is hung with miserable pictures of the saints, crosses innumerable, and Yankee mirrors without number. These last are suspended entirely out of reach; and if one wishes to shave, or adjust his toilet, he must do so without the aid of a mirror, be there ever so many in the room.

We passed on to the house of our host's wealthy

son, where we were invited to dine. Here we found another refreshment table ; and, after waiting some hours, dinner was announced. It was a queer jumble of refinement and barbarism ; the first predominating in everything, except in the mode of serving, which was chiefly performed by the master, his Mexican guests, and a few female serfs.

The plates, forks, and spoons, were of solid New Mexican silver, clumsily worked in the country. The middle of the table was strewed with the finest white bread, cut in pieces, and within the reach of every cover. At close intervals were glass decanters, of Pittsburg manufacture, filled with wine made on the plantation. The dishes were served separately. The first was soup maigre ; then followed roast chicken, stuffed with onions ; then mutton, boiled with onions ; then followed various other dishes, all dressed with the everlasting onion ; and the whole terminated by chille, the glory of New Mexico, and the frijole.

Chille the Mexicans consider the chef-d'œuvre of the cuisine, and seem really to revel in it ; but the first mouthful brought the tears trickling down my cheeks, very much to the amusement of the spectators with their leather-lined throats. It was red pepper, stuffed with minced meat.

From Bernallilo the valley opens, but narrows again at Zandia, an Indian town on a sand-bank at the base of a high mountain of the same name, said to contain the precious metals.

They were treading wheat here, which is done by making a circular "corral" on a level ground of clay ; upon this floor they scatter the wheat, turn in a dozen or more mules, and one or two Indians, who, with whoops, yells, and blows, keep the affrighted brutes constantly in motion. To separate the wheat from the chaff, both Indians and Mexicans use a simple hand-barrow, with a bottom of raw bull's-hide,

perforated with holes. I should suppose it must take an hour to winnow a bushel.

After dining sumptuously at Sandival's, we went to our camp in the Alameda. Here the valley is wide and well cultivated. The people of the surrounding country flocked in with grapes, melons, and eggs. Swarms of wild geese and sand cranes passed over camp. They frequent the river, and are undisturbed save when some American levels his rifle.

By observation, the latitude of this camp is 35 deg. 11 min. 50 sec., and the longitude 106 deg. 45 min. 00 sec. west of Greenwich.

September 6.—We encamped last night on very indifferent grass. Breakfasted with Don Jose Chavez, at Perdilla. When sitting, our chins just reached the table. There were five or six courses, ending with coffee. Before breakfast, we were summoned to mass in Don Jose's private chapel, where the eccentric person we met at yesterday's dinner officiated. Priest, fop, courtier, and poet, were curiously combined in one person. Proud of his pure white hand, he flourished it incessantly, sometimes running his fingers through his hair in imitation of some pretty coquette, and ever and anon glancing in one of the many looking-glasses with which the church was decorated. After mass, to our surprise, he delivered an eloquent discourse, eulogizing the grandeur, magnanimity, power, and justice, of the United States.

Attending mass before breakfast proved any thing but an appetizer. The church was crowded with women of all conditions, and the horrid reboso, which the poor use for shawls, bonnets, handkerchiefs, and spit-box, sent out an odour which the incense from the altar failed to stifle.

One fact struck me as singular in all the houses that we visited,—the ladies never made their appearance; and it was always by the merest accident that we caught a glimpse of one of the family.

At Isoletta, I became tired of the show, and seeing my servant talking at the door of one of his acquaintances, I took the liberty of asking permission to take a quiet siesta; but this was out of the question. The good woman overwhelmed me with a thousand questions about the United States, which could only be stopped by questioning her in return. She denounced Armijo; said, with a true Castilian flash of the eye, "I do not see how any man wearing those things," pointing to my shoulder-straps, "could run away as he did. He had a good army to back him, and could have driven you all back."

The valley suddenly contracts below Perdilla, between Isoletta and Peralta. On the east side of the river there is deep sand, and the country is perfectly barren.

I observed to-night, for time and latitude at my camp, about 500 feet north-west of Senora Chavez' private chapel; thirteen altitudes of Polaris give for the latitude of this place, 34 deg. 55 min. 57 sec.; and twelve of Corona Borealis, and nine of Alpha Pegasi, give the chronometric longitude 7h. 07m. 8.4s.

September 7.—The early part of last evening was most beautifully bright and serene; the air was of the most delightful temperature, varied occasionally by a gentle breeze from the south, wafting along the perfume of the vineyards. I made some observations for time and latitude; the last unsatisfactorily, owing to the brightness of the moon dimming the southern stars. About eleven o'clock, the whole character of the night was changed by an east wind that came rustling down from the mountains, driving the sand before it. Nearly the whole distance travelled in the last three days has been over drifting sand, with only occasional patches of firm soil.

After rising early to attend to some business, I walked over the town of Peralta, which is interspersed

with cotton-wood, growing in nearly the regular order of an apple orchard. I then repaired to head-quarters, at the palace of Mr. Ortera, a spacious one-story edifice five hundred feet front.

We marched and encamped near Tome. It was the eve of the fete of Tome, in honour of the Virgin Mary, and people from all parts of the country were flocking in crowds to the town. The primitive waggons of the country were used by the women as coaches. These waggons were heavy boxes mounted on wheels cut from large cotton-wood; over the top of the box was spread a blanket, and inside were huddled, in a dense crowd, the women, children, pigs, lambs, and "every thing that is his." The man of the family usually seated himself on the tongue of the waggon, his time divided between belabouring his beasts and scratching his head. In one of these waggons a violin was being played, and the women, who were sitting on their feet, made the most of the music by brandishing their bare arms and moving their heads to the cadence. At night there was a theatrical representation in the public square. The piece dramatized was from the Old Testament.

During the day I had been puzzled by seeing at regular intervals on the wall surrounding the capilla, and on the turrets of the capilla itself, (which, be it remembered, is of mud,) piles of dry wood. The mystery was now to be cleared up. At a given signal all were lighted, and simultaneously a flight of rockets took place from every door and window of the chapel; fire-works of all kinds, from the blazing rocket to children's whirligigs, were now displayed in succession. The pyrotechny was the handicraft of the priests. I must say the whole affair did honour to the church, and displayed considerable chemical knowledge. Most of the spectators were on mules, each with his woman in front, and it was considered

a great feat to explode a rocket under a mule's belly without previous intimation to the rider.

September 8.—Long shall I remember the fete of Tome, a scene at once so novel and so striking. To-day, my duties called me off early in the morning.

I had to examine guides in reference to the route to California, and engage such as I might think fit for the trip.

My last interview of this kind to-day was in a species of public building, or guard-house, where a number of Mexicans had collected with arms. Several written tablets hung round the walls, but they were perfectly illegible. Our business was cut short by the sound of passing music. A strange sight presented itself. In a sedan chair, borne by four men, was seated a wax figure nearly as large as life, extravagantly dressed; following immediately were three or four priests, with long tallow candles, a full yard in length. Some American Officers followed, each holding a candle. Unfortunately, I emerged just as this group was passing; there was no escape, and the moment I joined, a grave Mexican (apparently a man in authority) thrust a candle into my hand. I thought of my coat, my only coat, the coat which was on my back, and which must take me to California, and back again into the interior of Mexico! Suddenly there was a halt without any word of command, and in the confusion we jostled each other and distributed the tallow in great profusion.

It was thought proper that the officers should show every respect to the religious observances of the country, consequently they did not decline participating in these ceremonies.

The procession ended at the church. After the services there were concluded, we repaired to the house of the padre, where we found a collation.

We had proposed attending a theatrical representation going on in the open air, but a heavy squall of

wind and a few drops of rain put a stop to this amusement, and all retired to dress for the fandango, which is the name given to all collections of people where there is music and dancing.

A cotillion was attempted in honour of the Americans present, but this cold and formal dance soon gave way to the more joyous dances of the country, the Coona, the Bolero, and the Italiana. Every variety of figure was introduced, but the waltz was the basis of all except the Bolero, which, as danced here, resembles our negro jig.

At the dance we found a very plain, but a very intelligent woman, the sister of Armijo, who said he would return as soon as he settled his affairs in Chihuahua.

September 11.—Returned to Santa Fe.

September 15.—Sent Lieutenant Warner, with a party, consisting of Lieutenant Peck and three men, to determine the latitude of Taos and the topography of the road.

From the 15th to 25th September I was busily engaged in fitting out for California.

Lieutenant Abert, who was left dangerously ill at Bent's Fort, had not arrived on the 25th; but accounts reached me that he was convalescent, and on his way to Santa Fe, where he might shortly be expected. Lieutenant Peck was also an invalid, and neither being able to accompany us to California, I left, by the general's direction, the subjoined order for them to make a map of New Mexico, based upon the astronomical points and measurements determined by myself, and to furnish, from the best statistical sources, an account of the population and resources, military and civil, of the province.

SANTA FE, *September 14, 1846.*

SIR: I am charged by the general commanding to inform you that you will remain for the present in the

territory of New Mexico ; and should your health, or that of Lieutenant Peck, be sufficiently restored to return to duty, that you will continue the survey of this territory, commenced by myself, and follow it to completion, provided it does not interfere with other military duties which may be required of you by the officer left in command of the territory.

With the limited number of instruments that can be placed in your hands, it is not expected that you will conduct the survey on strict geodetic principles, yet it is believed that sufficient precision can be attained to answer all the requirements of the military and civil service.

The country from Taos to Fra Cristobal contains nearly all the ground that is under cultivation, and nearly all that is worth cultivating ; and for this whole distance it is open and bounded by high and conspicuous peaks, affording great facilities for conducting your operations.

I have established the astronomical position of six points in this territory, viz : camp 42, at Vegas ; camp 43, Vernal springs, Santa Fe ; camp 55, $1\frac{1}{4}$ miles south of the church of San Felipe ; camp 49, at the Alameda ; camp 51, at Peralta, at the mill ; and I shall establish two more, one at Taos, and the other at Socoro.

These points are quite sufficient, and will be the base of your operations ; and upon them you will form a trigonometric *canvass*. For this purpose, the rule requiring every angle of the series to be greater than 30 degrees may be wholly disregarded. And after having determined by triangulation the position of any three conspicuous peaks, the position of any other points, which are in view of the three first named, may be determined by the problem of three points, as is practised in hydrographic surveys.— Many such points will present themselves.

The canevas completed, the course of the De¹ Norte, that of its tributaries to the base of the mountains or beyond the settlements; the width of the valleys; the quantity of land under cultivation; the position of the towns, churches, hills, and all other topographical features of the country, can be determined with the Schmalkalder compasses.

If your force is sufficient, the operation described in this last paragraph may be carried on simultaneously with the triangulation. You are aware that I have no theodolite at my disposal; the triangulation must, therefore, be made with the sextant.

The population, number of cattle, horses, and sheep, and the quantity of grain and other agricultural products, the facilities and best localities for water power to propel machinery, and also the mineral resources of the country, it is very desirable to know. You will, therefore, give particular attention to acquiring all the information on these subjects which the present statistical knowledge in the country will afford.

A requisition for five thousand dollars will be made on the Bureau of Topographical Engineers, for the survey, to be placed to your credit with Mr. Robert Campbell, of St. Louis, upon whom, I should think, you might safely draw without waiting to hear from Washington.

I made a requisition on the bureau, dated June 18, 1846, for a transit instrument, and also for an instrument to obtain the magnetic dip and declination. Should these arrive, you will unpack them, mount the instruments near the place where I observed in Santa Fe, and commence a series of observations for longitude by moon culminating stars, and for the magnetic dip and declination.

The series for longitude will be continued for at least three lunations; and, should an opportunity pre-

sent itself, I wish the observations and results to be communicated to me in California.

I am, very respectfully,
Your obedient servant,

W. H. EMORY.

First Lieut. Corps Top. Engineers.

Lieutenant J. W. ALBERT, or, in his absence, Lieutenant W. G. PECK.

General orders were issued designating the force to march on California. It consisted of three hundred United States 1st dragoons, under Major Sumner, who were to be followed by the battalion of Mormons, five hundred in number, commanded by Captain Cooke.

Colonel Doniphan's regiment was to remain in New Mexico until relieved by Colonel Price's regiment, which was daily expected to reach there from the United States, when Colonel Doniphan's regiment was directed to effect a junction with General Wool at Chihuahua.

Major Clarke's two batteries of artillery were divided—one company, Captain Fisher's, to be left in New Mexico; the other, Captain Weightman's, to accompany Colonel Doniphan. The battalion of foot, under Captain Agney, was directed to remain in Santa Fe.

Thus was the army of the west divided into three columns, to operate in regions remote from each other, and never to unite again in one body.

September 25.—I received notice that the general was to march at 2 p.m., for California. His force consisted of three hundred dragoons, to be followed by a battalion of Mormons on foot, that had not yet arrived in Sante Fe.

My requisition for twelve pack-saddles and eight mules not being filled, I determined to delay starting

for an hour or two, and did not reach my camp, sixteen miles distant, till long after dark. I found my tent pitched, my supper smoking, and corn secured for my mules ; this was gratifying, and I congratulated myself on the re-organization of my party, at least so far as the *personnel* was concerned, for I had never found my camp so well attended to.

The day was excessively hot, the night very cold, the thermometer 32 deg.

Memorandum.—My party is now organised as follows :

Lieutenant Warner, topographical engineer, &c.
J. M. Stanly, draughtsman.
Norman Bestor, assistant.

Men.

James Early, driver to instrument waggon ;
W. H. Peterson, in charge of horizon-box and
cantina for sextants ;
Baptiste Perrot, driver of transportation waggon ;
Maurice Longdeau, in charge of spare mules ;
Francois de Von Cœur, in charge of spare mules ;
Frank Menard, assistant teamster ;
James Riley, assistant to Bestor ;
Dabney Eustis, assistant to Stanly, and the private
servants of Lieutenant Warner and myself.

Our road is over the ground heretofore travelled
and chronicled as far as Tome.

As evidence of the ignorance of the people here respecting the topography of the country, and also the ignorance of foreigners who have lived fifteen or twenty years in Santa Fe, no one could tell me where the Rio Santa Fe debouched into the Rio Grande.

I may here remark, that every night I furnished

the distances travelled over to General Kearney, at head-quarters, and very often (whenever required) the latitude of the camp. In many cases these and the distances have been published; I shall, therefore, not repeat them. The latitudes in some cases have been incorrectly reported, and in others recomputed, and are therefore now given as final results.

September 26, 27, 28, 29, and 30.—We marched over the same ground already travelled over and described, between the 2d and 7th of September.

Below Zandia we were attracted by a great noise. It proceeded from a neighbouring rancheria, where we saw eight or ten naked fellows hammering away in a trough full of corn-stalks, as I had never seen Mexicans exert themselves before. The perspiration from their bodies was rolling off into the trough in profusion, and mingling with the crushed cane. This was then taken out, boiled, and transferred to a press, as primitive in construction as anything from the hands of Father Abraham.

The hopper was the trunk of a scooped cotton-wood tree; into this was inserted a billet of wood, upon which the lever rested about midway. Men, women, and children were mounted on each end; all see-sawing in the highest glee. I suggested, as an improvement, that one end of the lever be confined, and the whole of the living weight be transferred to the other end. "No! no!" said the head man, "if I do that, the fun of see-sawing will be over, and I can't get anybody to work." The man was a disciple of Charles Fourier, and desired "to make labour attractive."

The morning of the 29th opened with a grand trade in mules and horses. A few days' experience was quite enough to warn us that our outfit would not answer, and the general directed that all the poor mules and horses should be exchanged for fat ones.

The scene reminded one more of a horse-market than a regular camp. The more liberal were our offers for the animals, the more exorbitant became the demands of the Mexicans.

At Albuquerque I was directed to call and see Madame Armijo, and ask her for the map of New Mexico, belonging to her husband, which she had in her possession. I found her ladyship sitting on an ottoman, smoking, after the fashion of her countrywomen, within reach of a small silver vase, filled with coal. She said she had searched for the map without success; if not in Santa Fe, her husband must have taken it with him to Chihuahua.

We crossed the Rio Grande del Norte at Albuquerque; its width was about twenty-five yards, and its deepest part just up to the hubs of the wheels. It is low at present, but at no time, we learned, is its rise excessive—scarcely exceeding one or two feet.

We encamped a little more than half-way between Albuquerque and Pardillas, on a sandy plain, destitute of wood, and with little grass.

We saw myriads of sand crane, geese, and brant.

September 30.—Feeling no desire to go over the same ground twice, I struck off on the table lands to the west, and found them a succession of rolling sand hills, with *Obione canescens*, *Fraseria acanthocarpa*, *yerba del sapa* of the Mexicans, and occasionally, at very long intervals, with scrub cedar about as high as the boot-top.

I saw here the hiding-places of the Navajoes, who, when few in numbers, wait for the night to descend upon the valley, and carry off the fruit, sheep, women, and children of the Mexicans. When in numbers, they come in day-time and levy their dues. Their retreats and caverns are at a distance to the west, in high and inaccessible mountains, where troops of the United States will find great difficulty

in overtaking and subduing them, but where the Mexicans have never thought of penetrating. The Navajoes may be termed the lords of New Mexico. Few in number, disdaining the cultivation of the soil, and even the rearing of cattle, they draw all their supplies from the valley of the Del Norte.

As we marched down the river to meet Ugarte and Armijo, the Navajoes attacked the settlements three miles in our rear, killed one man, crippled another, and carried off a large supply of sheep and cattle. To-day we have a report, which appears well authenticated, that the Mexicans, taking courage at the expectations of protection from the United States, had the temerity to resist a levy, and the consequence was, the loss of six men killed and two wounded.

They are prudent in their depredations, never taking so much from one man as to ruin him. Armijo never permitted the inhabitants to war upon these thieves. The power he had of letting these people loose on the New Mexicans was the great secret of his arbitrary sway over a people who hated and despised him. Any offender against Armijo was pretty sure to have a visit from the Navajoes.

I stopped at the little town of Isoletta, to visit my friend, the alcalde, who has the reputation, Indian though he be, of being the most honest man and best maker of brandy in the territory. Mr. Stanly accompanied me, for the purpose of sketching one of the women as a specimen of the race. I told the alcalde our object, and soon a very beautiful woman made her appearance, perfectly conscious of the purpose for which her presence was desired. Her first position was exquisitely graceful, but the light did not suit, and when Stanly changed her position, the charm of her attitude was gone.

We came down from the table lands through a

ravine, where the lava, in a seam of about six feet, overlaid soft sand-stone. At the point of junction, the sand was but slightly coloured. The lava was cellular, and the holes so large that the hawks were building nests in them.

At this ravine the Navajoes descended when they made their last attack; at the same moment the volunteers were ascending the other slope of the hill, on their way to garrison Cibolletta.

The camp of this date (September 30) is near the camp of September 6; and my observations this evening verified, in a very satisfactory manner, the travelling rate assumed for the chronometer 783. The longitude of camp of September 7, given by chronometer, is 7h. 07m. 00s.; that of this present camp, which is one mile west of it, is 7h. 07m. 08s. Here, in addition to my usual observations for the time and latitude, I took a set of lunar distances, with east and west stars.

Above this camp, there is on the river a considerable growth of cotton-wood; among which are found some "signs" of beaver. The plains and river bottoms were covered with much the same growth as that heretofore noted; to which may be added an *Erythraea*, a handsome little gentian-like plant, with deep rose-coloured flowers, and a *Solanum*, a kind of wild potato, with narrow leaves, which Dr. Torrey says is different from any in the United States.

October 1.—To-day, for the first time for six days, I was able to rise from my bed without assistance. The air was elastic, and fragrant with the perfumes of the wild sage from the adjacent hills. Every thing was, in truth, *couleur de rose*; for the sun beamed out bright and red, infusing the same tint over the landscape, till near the meridian. I crossed to Tome, in search of some non-complying guides. We re-crossed at Tome, and measured the section of the river. Accordingly, we found the Rio Grande

del Norte, many hundred miles from its source, 30 yards wide.

This section is about the same as at San Felipe and Santo Domingo. If to it we add the section of a stream of water carried off by two large zequias, each nine feet by two, we shall have an estimate of the volume of water discharged by this famous river, for 150 miles, through the most populous and fertile part of its valley.

Below Tome, for a few miles, the valley widens, the soil improves, and the cultivation is superior to any other part, particularly that of the rancherias around the pleasant little village of Belen.

October 2.—This morning we passed the pretty church in the village of Sabinal, after which the settlements became very few and far between. We encamped opposite La Lloya, at the bend of the river Del Norte, where the low sand-hills on either side seem to unite and shut up the valley.

We received a message from the major-domo of the neighbouring rancheria, cautioning us to be watchful of our animals, that forty of the Navajoes had passed the river last night. The incursions of these Indians have prevented the settlement and cultivation of this part of the country.

The sand-bank, at the foot of which we are encamped, is filled with serpentine, harder than that which is dug in such quantities from the site of Fort Marcy, near Santa Fe.

Now and then we came to spots from which the waters were prevented from escaping by the sand, and had evaporated, leaving saline incrustedations; about these we found growing abundantly Atriplex and Salicornia.

October 3.—The waggons from the rear not being up, we laid by all day, in hourly expectation of their arrival and an order to march. An express from

Colonel Price came in, informing us of his arrival in Santa Fe.

About 12 o'clock in the day, a Mexican came into camp, with his horse foaming, to say that the Navajoes had made an attack on the town of Pulvidera. One company of dragoons were immediately dispatched to the place, about twelve miles distant.

This camp was one of the prettiest of the whole march, on the curve of the river, fringed with large cotton-woods growing at intervals. The air was mild and balsamic, the moon shone brightly, and all was still as death, except when a flock of geese or sand-crane were disturbed in their repose. Several large cat-fish and soft-shell turtle were caught, and we saw blue-winged ducks, plovers, doves, and a few meadow larks.

No fact proves the indolence and incapacity of the Mexican for sport or for war more glaringly, than that these immense flights of sand-crane and geese are found quietly feeding within gunshot distance of their houses and largest towns. Going into Albuquerque, I started a hungry-looking wolf in a water-melon patch, close under the walls of the town.

October 4.—The waggons mounted the sand-hills with great difficulty. The river impinges so close on the hills as to make it necessary, on the western side, to mount the table-lands. These plains, reaching to the base of the mountains, are of the same character as heretofore mentioned, of rolling sand-hills, covered with *Obione canescens*, *Prosopis glandulosa*, (*romeria*.) *Riddellia tagetina*, *Pagapaga*, and a few patches of *grama*. This last is the only nutriment the plains afford for horses and cattle; but mules and asses, when hard pressed, will eat the *trato* and *romeria*. The *Chamisa* grows to a considerable height, and the stalk is sometimes two or three inches in diameter; a fire can be made of it sufficient to boil a kettle or roast an egg. To-day I

eat, for the first time, the fruit of the prickly pear, the "yerba de la vivera," of the Mexicans; as I was thirsty, it tasted truly delicious, having the flavour of a lemon with crushed sugar.

Below La Joya two sand-hill spurs, overlaid with fragments of lava and trap, project from the east and west, closing the valley, just leaving sufficient space for the river to pass between. The river winds below in a beautiful semicircle, bending to the west. On either side is excellent grass, apparently untouched, and shaded by large cotton-woods. To the west, the hills of Pulvidera form an amphitheatre. The whole picture, the loveliest I have seen in New Mexico, loses nothing by being projected, from where we stood, against the red walls of the Sierra Grande, which extend from Zandia southward, dividing the waters of the Puerco, of the east, from those of the Rio Grande.

I longed to cross these mountains and explore the haunts of the Apaches, and the hiding-place of the Camanches, and look up a nearer route home by the way of the Red river, which the hunters and voyageurs all believe to exist. But onward for California was the word, and he who deviated from the trail of the army must expect a long journey for his jaded beast and several days' separation from his baggage. We were not on an exploring expedition; war was the object; yet we had now marched one thousand miles without fleshing a sabre.

Arrived at the town of Pulvidera, which we found, as its name implies, covered with dust, we received full accounts of the attack made on the town by the Apaches the day before. The dragoons arrived too late to render assistance.

About one hundred Indians, well mounted, charged upon the town, and drove off all the horses and cattle of the place. The terrified inhabitants fled to their mud houses, which they barricaded. The people of

Lemitas, a town two miles below, came to the rescue, and seized upon the pass between the Sierra Pulvadera, and the Sierra Socoro. The Indians seeing their retreat with the cattle and goats cut off, fell to work like savages as they were, killing as many of these as they could, and scampered off over the mountains and cliffs with the horses and mules, which they could more easily secure.

This same band entered the settlements some miles above when we were marching on Santa Fe, and when Armijo had called all the men of the country to its defence. In this foray, besides horses, they carried off fifteen or sixteen of the prettiest women.

Women, when captured, are taken as wives by those who capture them, but they are treated by the Indian wives of the capturers as slaves, and made to carry wood and water; if they chance to be pretty, or receive too much attention from their lords and masters, they are, in the absence of the latter, unmercifully beaten and otherwise maltreated. The most unfortunate thing which can befall a captive woman is to be claimed by two persons. In this case, she is either shot or delivered up for indiscriminate violence.

These banditti will not long revel in scenes of plunder and violence. Yesterday Colonel Doniphan's regiment was directed to march into their country and destroy it. One of their principal settlements, and farming establishments, is said to be nearly due west from here, about two days' march; the road leading through the formidable pass above noted.

Yesterday and to-day we came across some unoccupied strips of ground. Their number yesterday was greater than to-day; for, since we passed Pulvadera, the sand-hills encroach on the river and leave the valley scarcely a mile wide. The cotton-wood, however, is getting more plentiful, and we have not

been obliged to use the *bois-de-vach* in cooking for some days.

To-night I measured two sets, or 18 lunar distances, east and west of the moon; 12 altitudes of Polaris, 10 of Andromedæ, and 8 of Alpha Lyrae.

The resulting latitude 34 deg. 07 min. 39 sec.

Longitude 7h. 07m. 54s.

October 5.—*Camp near Socoro*—Last night a Mexican came into camp, and said we should now leave the river and strike for the Gila, nearly due west. He was one of the men engaged by me as guide while on the first trip to Tome. We accordingly moved only six miles to-day, and encamped a little north of Socoro, preparatory to taking the hills to-morrow. The prospect is forbidding; from the Sierra Lescadron, opposite the amphitheatre, as far south as the eye can reach on the western side of the river, is a chain of precipitous basaltic mountains, traversed by dykes of trap. Through these we are to pass.

I rode to the base of the Sierra Socoro, overhanging the town of that name, and about three miles distant from the river. It is a confused mass of volcanic rocks, traversed by walls of a reddish coloured basalt and seams of porphyritic lava and metamorphic sandstone. In one or two places, where the water had washed away the soil near the base, I found specimens of galena and copper ore, very pure; but of the extent of these beds I can form no opinion, nor can I say positively they were not erratic. The ore in this mountain is said, at one time, to have been worked for gold; but the difficulty of getting quicksilver induced the operator to move to a mine on the opposite side of the river, near Manzanas, where, it is said, quicksilver is to be found; but the specimens from that place, of what the inhabitants exhibited as rock containing quicksilver, on analysis, was found to contain none. Should the command halt to-morrow

to prepare for the mountains, I shall be enabled to give the place a more thorough examination.

To the east, close to the banks of the river, still runs the Sierra Grande, which commences at Zandia with such towering heights, but here tapers down to moderate sized hills. The formation is apparently of different coloured sandstone, and wherever the stratification shows itself, dipping about twenty-five degrees to the south and east; but in some places it is horizontal, and in others showing great disturbance. With the glass may be seen walls of light-coloured stone, basalt or trap, running off for miles in a straight line, nearly north and south. The town of Socoro, containing about one hundred inhabitants, is prettily situated in the valley of the river, which is here almost circular, and about three or five miles in diameter. The church, as usual, forms the salient point, which meets the eye at a great distance.

The growth on the sand plains to-day was chiefly *iodeodonda** and a little stunted *acacia*. The *iodeodonda* is a new plant, very offensive to the smell, and, when crushed, resembling kreosote. Its usual growth is about the height of a man on horseback, and is the only bush which mules will not eat when excessively hungry; besides this were two well-known and widely diffused grasses, the reed grass and a short, salty grass, *Uniola distichophylla*.

October 6.—It was determined to follow the river still further down before turning west. Great difficulty was experienced in getting teams to assist us. The Mexicans we had engaged, as if by universal agreement, refused to go farther, alleging fear of the

* Since writing the above, the following extract of a note from Dr. Torrey was received in reference to this plant, which is so remarkable, and extends over so great a surface.

"The *IODEODONDA* I find described in a late work by Moricand, entitled 'PLANTES NOUVELLES OU RARES D'AMERIQUE!' It is described by him as a new genus, under the name *Larrea*. It is well figured in his 48th plate as *LARREA MEXICANA*. In its affinities it is allied to *GUAJACUM*."

Apaches ; but the truth was they expected to extort money. In Armijo's day, when a thing was wanted for government, it was taken. Our treatment turned their heads, and, like liberated slaves, there was no limit to their expectations and exactions. We used every means to bring these people to reason, but finding them intractable, and that the progress of the army was arrested, the quartermaster, Major Swords, seized what waggons and animals were needed, and paid a liberal price for them. To our surprise they were perfectly enchanted at the whole business ; first at being paid at all, but principally at being relieved from the responsibility of deciding for themselves what they would take for the chattels. A likely boy, who had been engaged to go to California as arriero, was to-day claimed by his creditor or master. He owed the man 60 dollars, and was, by the law of the country, paying this debt by serving at 2 dollars per month ; out of this he was to feed and clothe himself, his master being sutler. It was plain he could not pay his debt in his lifetime. When such debtors get old and unfit for labour, it is the custom to manumit them with great pomp and ceremony. This makes the beggars of the country. The poor debtors thus enthralled for life, for a debt of 60 dollars, are called peons, and constitute, as a class, the cheapest labourers in the world. The price of the labour for life of a man was, in the case we have stated, 60 dollars, without any expense of rearing and maintenance in infancy or old age, the wages covering only a sum barely sufficient for the most scanty supply of food and clothing.

I saw some objects perched on the hills to the west, which were at first mistaken for large cedars, but dwindled by distance to a shrub. Chaboneau (one of our guides) exclaimed " Indians ! there are the Apaches !" His more practised eye detected human figures in my shrubbery. They came in and held a

council, swore eternal friendship as usual, no doubt with the mental reservation to rob the first American or Mexican they should meet unprotected.

The women of this tribe rode a la Duchess de Berri, and one of them had an infant, about two months old, swung in a wicker basket at her back. Their features were flat, and much more negro-like than those of our frontier Indians ; a few Delawares in camp presented a strong contrast, in personal appearance and intelligence, with the smirking, deceitful-looking Apache. Some of them had fire-arms, but the greater part were armed with lance and bow. They were generally small legged, big bellied and broad shouldered.

Came into camp late, and found Carson with an express from California, bearing intelligence that that country had surrendered without a blow, and that the American flag floated in every port.

October 7.—Camp 68.—Two Mexicans deserted from my party last night, frightened by the accounts of the hardships of the trip brought by Carson and his party. Yesterday's news brought some changes in our camp ; one hundred dragoons, officered by Captain Moore and Lieutenants Hammond and Davidson, with General Kearney's personal staff, Major Swords, Captain Johnson, Captain Turner, adjutant-general to the army of the west, Messrs. Carson and Robideaux, my own party organized as before mentioned, and a few hunters of tried experience, formed the party for California. Major Sumner, with the dragoons, was ordered to retrace his steps. Many friends here parted that were never to meet again ; some fell in California, some in New Mexico, and some at Cerro Gordo.

Arrived in camp late, after a most fatiguing day, watching and directing the road for my overloaded and badly horsed waggon. I sat up until very late, making astronomical observations.

About two miles below the camp of last night, we passed the last settlement, and in about four miles left the beaten road, which crosses the east side of the river, and thenceforth a new road was to be explored. The land passed over to-day, although unsettled, is incomparably the best in New Mexico; the valley is broader, the soil firmer, and the growth of timber, along the river, larger and more dense.

The ruins of one or two deserted modern towns, probably Valverde, and remains of ditching, for irrigation, were passed to-day. The frequent incursions of the Indians are said to cause the desertion of this part of the valley.

As we approached our camp, the lofty range of mountains sweeping to the north-west, around the head of the Gila, became unmasked, at the same moment that the Puerco range showed themselves on the eastern side of the river Del Norte, stretching boldly and far away to the south. This last ridge of mountains is to the east, and altogether distinct from that commencing at Zandia, and tapering off to the south close to the river.

I have heretofore revelled in the perfect stillness and quietude of the air and scenery of New Mexico; yesterday and to-day have been exceptions, for the wind has been very high from the south, and the dust overwhelming.

Computed to-day the height of the Socoro mountain to be 2,700 feet above the level of the plain. Several officers guessed at the height of the mountain, and the mean of all the guesses was 1,200 feet, and the distance of the peak only two and a half miles, while it was in fact, upwards of four miles. He who attempts to reckon the height and distance of hills in this pure, dry atmosphere, after coming from ours, will always fall as much short of the mark.

One or two large white cedars were seen to-day, and, in addition to the usual plants, was that rare one

cevallia sinuata, and a species of wild liquorice, but with a root not sweet, like the European kind.

The latitude of this camp by 10 altitudes of Polaris, 33 deg. 41 min. 19 sec. And the longitude, from 18 observations, of east and west stars, 7h. 08m. 57s.

October 8.—Camp 69.—The valley of the Del Norte, as we advance, loses what little capacity for agriculture it possessed. The river commences to gather its feeble force into the smallest compass to work its way around the western base of Fra Cristobal mountain. The Chihuahua road runs on the eastern side, and that part of it is the dreaded jornada of the traders, where they must go, most seasons of the year, ninety miles without water.

Our road over hill and dale led us through a great variety of vegetation, all totally different from that of the United States. To-day's observations of the plants may be taken as a fair specimen of the southern part of New Mexico. First, there were cacti in endless variety and of gigantic size, the disagreeable *Larrea Mexicana*, *Obione canescens*, *Tessaria borealis*, *Diotis lanata*, *Franseria acanthocarpa*, several varieties of mezquite, and among the plants peculiar to the ground passed over, were several compositæ, a species of *Malva convolvulus*, an unknown shrub found in the beds of all deserted rivers; larger grama, as food for horses, nearly equal to oats, and *Dalea formosa*, a much branched shrub, three feet high, with beautiful purple flowers. The infinite variety of cacti could not be brought home for analysis, and this department of the Flora must be left to the enterprise of some traveller, with greater means of transportation than we possessed. A great many were sketched, but not, it is feared with sufficient precision to classify them.

The table-lands, reaching to the base of the mountains to the west, are of sand and large round pebbles, terminating in steep hills from the river, capped

with seams of basalt. Some curious specimens of soft sandstone were seen to-day, of all shapes and forms, from a batch of rolls to a boned turkey.

October 9.—The country becomes broken, and the valley narrows into a canon which sweeps at the base of Fra Cristobal mountain, making it necessary to rise to the table-lands on the west side, which we found traversed by deep arroyos, crowned on their summits by basalt, underlaid by sandstone.

I shot two or three quails, (*ortix squamosu?*) differing from ours in their plumage, but entirely similar to them in their habits. We also killed a hawk resembling, in all respects, our sparrow-hawk, except in the plumage, which, like the quail, was that of the landscape, lead-coloured.

Game in New Mexico is almost extinct, if it ever existed to any extent. To-day we saw a few black-tailed rabbits, and last night Stanly killed a common Virginia deer.

Three distinct ranges of mountains, on the west side of the river, are in view to-day, running apparently north-west, and nearly parallel to each other. The lesser range commences at Socoro; the next at Fra Cristobal mountain, and the last at a point farther west, yet to be determined. The ravines between are broad, and show the beds of dry streams, which would probably be found watered when near their sources. A butte was seen in the distance, close to the river, and surrounded by trees, which was at first taken for an adobe house; but the near approach showed it a conglomerate cemented by lime, which had been left standing when the surrounding earths were washed away. At its base I found some rare specimens of olivine, set in lava. The road was unbroken, obstructed by bushes, and so bad that the waggons made only $11\frac{1}{2}$ miles, and the teams came into camp "*blown*" and staggering after their day's work. Expecting nothing better a-head, it was determined to leave the

waggons and send back for pack-saddles. My own pack-saddles having been brought along, I had time to observe the rates of my chronometers, and make other preparations necessary for so important a change in our mode of proceeding.

October 10th, 11th, and 12th were passed in camp, waiting for the pack-saddles.

We are now 203 miles from Santa Fe, measured along the river; 16 circum-meridian altitudes of Beta Aquarii, and 17 altitudes of Polaris, give me for the latitude of the place 33 deg. 20 min. 02 sec., and the longitude, by the chronometer, 7h. 08m. 57s. We must soon leave the river. A cross section of it at this point is 118 feet wide, with a mean depth of 14 inches, flowing over large round pebbles, making it unsuitable for navigation with any kind of boats.

The height of our first camp on the Del Norte, one mile north of San Felippe, indicated by the barometer, was 5,000 feet, showing we had descended, from Santa Fe, 1,800 feet.

Here the height is 4,241 feet, showing an average fall in the Del Norte, from the camp near San Felippe to this place, of four feet and a half per mile. The greater part of the way the fall is uniform and unobstructed by rapids; and the river flows, for the most part, over a bed of sand, without any sensible increase or diminution in its volume of water. Sometimes its tranquil course is rippled by large angular fragments of basalt, trap, lava, and amygdaloid, which everywhere strew the table lands of New Mexico.

Our present camp is in a valley 70 or 100 acres in extent, well grassed and wooded, and apparently untrodden by the foot of man; for here we saw, for the first time in New Mexico, any considerable "signs" of game in the tracks of the bear, the deer, and the beaver. We flushed several bevies of the

blue quail, saw a flock of wild geese, summer duck, the avocet, and crows.

Above and below us is a canon, and on the eastern side of the river the Fra Cristobal shoots up to a great height. We saw on its sides, reaching nearly to the top, large black objects which we could not distinguish with our indifferent glasses, but which must be either shrubbery or rocks.

For the last night or two it has been unusually cold, the thermometer ranging from 25 deg. to 32 deg. Farenheit, but during the day it mounts up to 75 deg. and 80 deg.

October 13.—Moved one mile to get better grass. Just as we had pitched our new camp, Lieutenant Ingalls came up with a mail, and gave the pleasant information that the saddles were only about six hours behind.

October 14.—We parted with our waggons, which were sent back under charge of Lieutenant Ingalls, and, in doing so, every man seemed to be greatly relieved. With me it was far otherwise. My chronometers and barometer, which before rode so safely, were now in constant danger. The trip of a mule might destroy the whole. The chronometers, too, were of the largest size, unsuited to carry time on foot or horseback. All my endeavours, in the 24 hours allowed me in Washington to procure a pocket chronometer, had failed. I saw then, what I now feel, the superiority of pocket over large chronometers for expeditions on foot or horseback. The viameter for measuring distances, heretofore attached to the wheel of the instrument waggon, was now attached to the wheel of one of the small mounted howitzers.

The valley narrows into a canon at Bush peak, and opens again a mile or so wide, where we encamped for the night. The growth of to-day is much the same as yesterday.

Rush peak is, on its river face, a steep escarpment of basalt, and abreast of it, on the west side of the river, we saw many chips of metalliferous limestone. To-day, met a solitary Mexican mounted on a mule, driving before him a horse, with his back literally skinned with the saddle. He was beating the poor beast over the galled place. The Mexicans generally treat their horses and mules in a barbarous manner, riding and packing them when their backs are running with sores.

October 15.—After travelling three and a half miles, we turned off from the Del Norte and took final leave of it at a pretty little grove, where we found two Mexicans returning from a trading expedition to the Apaches. They were attending a poor worn out jennet, (that had been maltreated and overtasked,) in the hope that a few days' rest would enable it to take their lazy bodies to the settlements.

At this point, several intelligent guides were detached to look up a road further south, by which Captain Cooke, who is to follow us with the Mormons, may turn the mountains with his waggons.

After mounting to the table-land, some 200 feet above the valley, it is very level, except where the table-land is indented by the streams from the mountains, most of which are now dry. We passed two in succession, both deep and wide enough to contain all the water of the Mississippi, and presenting the appearance of the deserted beds of once large and turbulent rivers. The beds were paved with large round pebbles, mostly of the red fieldspathic granite.

On the table-land the winter grama (a more delicate grass than summer grama) was in great abundance, but now dry and sunburnt.

Far off to the south, between the peaks of two high mountains, stretched the table-land contiguous to the valley of the Del Norte. For the first time since leaving the Arkansas the mirage was seen, and gave the

wide opening the appearance of a sheet of water disturbed by the wind. Two distant peaks looming up, looked for all the world, like a fore-and aft-schooner. As I was observing this, my mule came to a halt at the edge of a steep precipice. Below were green trees and luxuriant foliage, the sure indication of water. The stream was clear, limpid, and cool, the first, but one, I had seen since crossing the Alleghanies, where water could be drunk without imbibing a due proportion of mud and sand.

In the valley grows cotton-wood, a new variety of evergreen oak, with leaves like the holly, a new variety of ash, and a new kind of black walnut, with fruit about the size of ours. The oak was covered with red balls, the size and colour of apricots—the effects of disease or the sting of an insect.

Four miles further brought us to another creek of clear water, running sluggishly, and like the last the size of a man's waist. In its valley were many large trees, uprooted, presenting the appearance of newly-cleared ground.

On the plains and in the dry valleys were many rare specimens of chalcedony. The only living thing seen was a small rattlesnake, the first since we left Vegas, of the size and mark of the small prairie snake, but of a reddish hue, like that of the ground it inhabited.

Observed to-night for latitude and longitude; our height was (approximately) 4,810 feet above the sea.

October 16.—We commenced the approach to the Mimbres mountains over a beautiful rolling country, traversed by small streams of pure water, fringed with a stunted growth of walnut, live-oak and ash. The soil in the valleys and to the hill-tops is of the best quality, covered with a luxuriant growth of grama, *Chondrosium fænum*, differing from the large grama. Nothing but rain is required to make this

part of the country inhabitable. There were several new and beautiful varieties of cactus, and the *Diotis lanata* grew in great luxuriance ; one a miniature tree, with the stalk six inches in diameter.

This must one day become a great grazing country, particularly for sheep. The pure dry air is eminently adapted to them, and they are said to be in all New Mexico very prolific, an ewe seldom failing to drop two lambs.

October 17.—We ascended from the stream, on which we were encamped, by a narrow valley for two-and-a-half hours before reaching the summit between it and the Mimbres, which was so indistinct, that I passed it several miles before discovering it. We descended in an arroyo towards the Rio Mimbres, very narrow, and full of shattered pitch stone ; the sides and bank covered with a thick growth of stunted live-oak. In full view, nearly the whole time of our descent, was a mountain of peculiar symmetry, resembling the segment of a spheroid. I named it "the Dome." Our road led along its base to the north ; another path leading to Janos, a frontier town in Sonora, passes down the Mimbres on the south side. The Mimbres was traversed only a mile ; for that distance its valley was truly beautiful, about one mile wide, of rich fertile soil, densely covered with cotton-wood, walnut, ash, &c. It is a rapid, dashing stream, about fifteen feet wide and three deep, affording sufficient water to irrigate its beautiful valley. It is filled with trout. At this place we found numberless Indian lodges, which had the appearance of not having been occupied for some time. We turned westward, and ascended all the way to our camp.

The mountains appeared to be formed chiefly of a reddish Amygdaloid and a brown altered sandstone, with chalcedonic coating. In places, immense piles of conglomerate protruded ; disposed in regular strata, dipping to the south at an angle of 45 de-

grees. There was also one pile of volcanic glass brittle, in strata about half an inch thick, dipping 45 degrees to the south. The character of the country and its growth to-day are very similar to those of yesterday; several new plants and shrubs, amongst which was the *cercocarpus parvifolius*, a curious rosaceous shrub, "with a spiral, feathery tail, projecting from each calyx when the plant is in seed." The spiral-tailed or barbed seed-vessels fall when ripe, and, impelled by the wind, work into the ground by a gyratory motion. The cedar seen to-day was also very peculiar; in leaf, resembling the common cedar of the States, but the body like the pine, except that its bark was much rougher.

At night, 12 circum-meridian altitudes of Beta Aquarii, and seven altitudes of Polaris, give for the latitude of the camp 42 deg. 11 min.

October 18.—A succession of hills and valleys covered with cedar, live oak and some long-leaved pine. We passed at the foot of a formidable bluff of trap, running north-west and south-east, which I named Ben Moore, after my personal friend, the gallant Captain Moore, of the 1st Dragoons. In many places the path was strewed with huge fragments of this hard rock, making it difficult for the mules to get along. Turning the north end of Ben Moore bluff, we began to drop into the valley of what is supposed an arm of the Mimbres, where there are some deserted copper-mines. They are said to be very rich, both in copper and gold, and the specimens obtained sustain this assertion. We learned that those who worked them made their fortunes; but the Apaches did not like their proximity, and one day turned out and destroyed the mining town, driving off the inhabitants. There are the remains of some twenty or thirty adobe houses, and ten or fifteen shafts sinking into the earth. The entire surface of the hill into

which they are sunk is covered with iron pyrites and the red oxide of copper.

Many veins of native copper were found, but the principal ore is the sulphuret. One or two specimens of silver ore were also obtained.

Mr. M'Knight, one of the earliest adventurers in New Mexico, was the principal operator in these mines, and is said to have amassed an immense fortune. On his first arrival in the country he was suspected to be an agent of the United States, and thrown into prison in Sonora, where he was kept in irons for eleven years. He is said to have stated that the gold, found in the ore of these mines, paid all the expenses of mining, and the transportation of the ore to the city of Mexico, where it was reduced. We were disappointed in not meeting the Apaches yesterday and to-day. This afternoon three men came in dressed very much like the Mexicans, mounted on horses. They held a talk, but I do not know the purport. This afternoon I found the famous mezcal, (an agave,) about three feet in diameter, broad leaves, armed with teeth like a shark; the leaves arranged in concentric circles, and terminating in the middle of the plant in a perfect cone. Of this, the Apaches make molasses, and cooked it with horse meat.

We also found to-day the *Dasyllirion graminifolium*, a plant with a long, narrow leaf, with sharp teeth on the margin, with a stalk eighteen feet high. According to Doctor Torrey, it has lately been "described by Zuccarini," who says "four species of this genus are now known, all of them Mexican or Texan."

The elevation of this camp was 6,167 feet.

October 19.—I tried last night to get observations for latitude, &c., but the early part was cloudy, and we fell asleep and did not wake till broad daylight. In the afternoon there was a thunder-storm to the west, which swept around towards the north, where it thundered and lightened till nearly nine o'clock.

The country passed over in the first part of to-day was beautiful in the extreme; a succession of high rolling hills, with mountains in the distance. The soil rich, and waving with grama. The latter part was more barren, and covered with artemisias.

The spring of San Lucia, $13\frac{1}{2}$ miles from the copper mines, very large, and impregnated with sulphur, is in a beautiful valley, surrounded at the distance of ten or fifteen miles, with high mountains. This was the place appointed for meeting the Apaches, at 11, A. M.; but arriving at 12, and not finding them as we expected, and the grass all eaten up, we moved on to Night creek, making 30 miles. We halted at night on unknown ground, by the side of a creek, so miry that the mules, some of which had not drunk since morning, refused to approach it. It was dark; many of the men mistook the trail and got on the wrong side of the treacherous creek. The mules began to bray for water, and the men to call out for their messmates; all were in confusion. My thoughts of last night came vividly to my mind, as I heard the voice of my chronometer-man on the other side, asking to be shown the way across. I sent him word to retrace his steps two or three miles.

The assembly call was sounded, which seemed to settle all things; and, as far as the clouds would allow me, I obtained observations. This is only the second time since leaving the 100th degree of longitude that I have been interrupted by clouds in my observations. Nothing has been heretofore more rare than to see the heavens overcast.

An Apache has just come in, and says the people who agreed to meet us at the spring yesterday, are coming on with some mules to trade.

Three miles from the camp of last night we had reached the "divide," and from that point the descent was regular and continuous to Night creek. The ravines on either side of the "divide" are covered

with fragments of blue limestone, and rich specimens of the magnetic oxides of iron.

October 20.—My curiosity was excited to see by daylight how my camp was disposed, and what sort of place we were in. It was quite certain the broad level valley we had been travelling the last few miles was narrowing rapidly, by the intrusion of high precipices; and the proximity of great mountains in confused masses, indicated some remarkable change in the face of the country. We were, in truth, but a few miles from the Gila, which I was no less desirous of seeing than the Del Norte.

The general sent word to the Apaches he would not start till 9 or 10. This gave them time to come in, headed by their chief, Red Sleeve. They swore eternal friendship to the whites, and everlasting hatred to the Mexicans. The Indians said that one, two, or three white men might now pass in safety through their country: that if they were hungry, they would feed them; or, if on foot, mount them. The road was open to the Americans now and for ever. Carson, with a twinkle of his keen hazel eye, observed to me, “I would not trust one of them.”

The whole camp was busily engaged in attempting to trade. The Indians had mules, ropes, whips, and mezcal. We wished to get a refit in all save the mezcal, offering to give in exchange red shirts, blankets, knives, needles, thread, handkerchiefs, &c., &c.; but these people had such extravagant notions of our wealth, it was impossible to make any progress. At length the call of “boots and saddles” sounded. The order, quickness, and quietude of our movements seemed to oppress them. One of the chiefs, after eying the general with apparent great admiration, broke out in a vehement manner: “You have taken New Mexico, and will soon take California; go then, and take Chihuahua, Durango, and Sonora. We will help you. You fight for land; we care nothing for

land ; we fight for the laws of Montezuma, and for food. The Mexicans are rascals ; we hate and will kill them all." There burst out the smothered fire of three hundred years ! Finding we were more indifferent than they supposed to trade, and that the column was in motion, they became at once eager for traffic.

They had seen some trumpery about my camp which pleased them, and many of them collected there. My packs were made. One of my gentlest mules at that moment took fright, and went off like a rocket on the back trail, scattering to the right and left all who opposed him. A large, elegant looking woman, mounted astraddle, more valiant than the rest, faced the brute, and charged upon him at full speed. This turned his course back to the camp ; and I rewarded her by half a dozen biscuits, and through her intervention, succeeded in trading two broken-down mules for two good ones, giving two yards of scarlet cloth in the bargain. By this time a large number of Indians had collected about us, all differently dressed, and some in the most fantastical style. The Mexican dress and saddles predominated, showing where they had chiefly made up their wardrobe. One had a jacket made of a Henry Clay flag, which aroused unpleasant sensations, for the acquisition, no doubt, cost one of our countrymen his life. Several wore beautiful helmets, decked with black feathers, which, with the short shirt, waist-belt, bare legs and buskins, gave them the look of pictures of antique Grecian warriors. Most were furnished with the Mexican cartridge box, which consists of a strap round the waist, with cylinders inserted for the cartridges.

These men have no fixed homes. Their houses are of twigs, made easily, and deserted with indifference. They hover around the beautiful hills that overhang the Del Norte, between the 31st and 32nd parallels of latitude, and look down upon the

States of Chihuahua and Sonora ; and woe to the luckless company that ventures out ungarded by a strong force. Their hills are covered with luxuriant grama, which enables them to keep their horses in fine order, so that they can always pursue with rapidity, and retreat with safety. The light and graceful manner in which they mounted and dismounted, always upon the right side, was the admiration of all. The children are on horseback from infancy. There was amongst them a poor deformed woman, with legs and arms no longer than an infant's. I could not learn her history, but she had a melancholy cast of countenance. She was well mounted, and the gallant manner in which some of the plumed Apaches waited on her, for she was perfectly helpless when dismounted, made it hard for me to believe the tales of blood and vice told of these people. She asked for water, and one or two were at her side ; one handed it to her in a tin wash-basin, which, from its size, was the favourite drinking cup.

We wended our way through the narrow valley of Night creek.

On each side were huge stone buttes, shooting up into the skies.

At one place we were compelled to mount one of these spurs almost perpendicular. This gave us an opportunity of seeing what a mule could do. My conclusion was, from what I saw, that they could climb nearly as steep a wall as a cat. A pack slipped from a mule, and, though not shaped favourably for the purpose, rolled entirely to the base of the hill, over which the mules had climbed.

A good road was subsequently found turning the spur and following the creek, until it debouched into the Gila, which was only a mile distant.

Some hundred yards before reaching this river, the roar of its waters made us understand that we were to see something different from the Del Norte. Its

section, where we struck it, 4,347 feet above the sea, was fifty feet wide, and an average of two feet deep. Clear and swift, it came bouncing from the great mountains which appeared to the north about sixty miles distant. We crossed the river, its large round pebbles and swift current causing the mules to tread warily.

We followed its course, and encamped under a high range of symmetrically formed hills overhanging the river. Our camp resembled very much the centre of a yard of huge stacks.

We heard the fish playing in the water, and soon those who were disengaged were after them. At first it was supposed they were the mountain trout, but, being comparatively fresh from the hills of Maine, I soon saw the difference. The shape, general appearance, and the colour, are the same; at a little distance, you will imagine the fish covered with delicate scales, but, on closer examination, you will find that they are only the impression of scales. The meat is soft, something between the trout and the catfish, but more like the latter. They are in great abundance.

We saw here also, in great numbers, the blue quail. The bottom of the river is narrow, covered with large round pebbles. The growth of trees and weeds was very luxuriant; the trees chiefly cottonwood, a new sycamore, mesquite, pala, (the tallow tree of our hunters,) a few cedars, and one or two larch. There were some grape and hop vines.

Sixteen circum-meridian observations of Beta Aquarii, and 9 of Polaris, give the latitude of this camp 32 deg. 50 min. 08 sec. Its approximate longitude is 108 deg. 45 min. 00 sec.

October 21.—After going a few miles, crossing and recrossing the river a dozen times, it was necessary to leave its bed to avoid a canon. This led us over a very broken country, traversed by huge dykes of trap and walls of basalt. The ground was

literally covered with the angular fragments of these hard rocks.

From one of these peaks we had an extended view of the country in all directions. The mountains run from north-west to south-east, and rise abruptly from the plains in long narrow ridges, resembling trap dykes on a great scale. These chains seem to terminate at a certain distance to the south, leaving a level road, from the Del Norte about the 32nd parallel of latitude, westward to the Gila. These observations, though not conclusive, agree with the reports of the guides, who say Col. Cooke will have no difficulty with his waggons.

The mountains were of volcanic rock of various colours, fieldspathic granite, and red sandstone, with a dip to the north-west, huge hills of a conglomerate of angular and rounded fragments of quartz, basalt, and trap, cemented by a substance that agrees well with the description I have read of the puzzolana of Rome.

The earth in the river bed, where it was not paved with the fragments of rocks, was loose, resembling volcanic dust, making it unsafe to ride out of the beaten track. A mule would sometimes sink to his knee; but the soil was easily packed, and three or four mules in advance made a good firm trail.

This was a hard day on the animals, the steep ascents and descents shifting the packs, and cutting them dreadfully.

The howitzers did not reach camp at all.

A few pounds of powder would blast the projections of rock from the canon, and make it passable for packs, and possibly for waggons also. The route upon which the waggons are to follow is, however, to the south of this. Under this date, in the catalogue of plants, will be found many different from those heretofore observed; amongst them, a new shrub, with an edible nut, and many varieties of mesquite.

October 22.—The howitzers came up about 9 o'clock, having, in the previous day's work, their shafts broken, and, indeed, every thing that was possible to break about them. We again left the river to avoid a canon, which I examined in several places, and saw no obstacles to a good road. The canon was formed by a seam of basalt, overlaying limestone in regular strata. Through these the river cuts its way.

Many deep arroyos have paid tribute to the Gila, but in none have we yet found water. Following the bed of one of these, to examine the eccentric geological formation it displayed, I found unknown characters written on a rock, copies of which were made, but their antiquity is questionable.

We were now fast approaching the ground where rumour and the maps of the day place the ruins of the so-called Aztec towns. This gave the characters alluded to additional interest; they were indented on a calcareous sandstone rock, chrome-coloured on the outside, presenting a perfectly white fracture. This made them very conspicuous, and easily seen from a distance. The colouring matter of the external face of the rock may proceed from water, as there was above the characters a distinct water line and every appearance that this gorge had more than once been the scene of overflows and devastation.

We encamped on a bluff, high above the river, in view of a rock which we named, from its general appearance, Steeple rock.

Latitude of our camp to-night, by 17 circum-meridian altitudes of Beta Aquarii, 32 deg. 38 min. 13 sec. Longitude 109 deg. 07 min. 30 sec.

October 23.—Last night the heavens became overcast, the air damp, and we expected, for the first time since leaving Santa Fe, (a month to-morrow,) to have a sprinkle of rain; but, at 9 this morning, the clouds had all been chased away, and the sun

careered up in undisputed possession of all above the horizon. The atmosphere resumed its dryness and elasticity, and at night the stars looked brighter, and the depth of the spaces between, greater than ever.

The changes of temperature are very great, owing to the distance from the influence of large masses of water, and, if they were accompanied by corresponding changes in humidity, they would be insupportable. Last night we went to bed with the thermometer at 70 deg. Fahrenheit, and awakened this morning shivering, the thermometer at 25 deg. yet, notwithstanding, our blankets were as dry as though we had slept in a house.

The table land, 150 feet above the river, was covered so thick with large paving pebbles as to make it difficult to get a smooth place to lie upon.

The growth of to-day and yesterday, on the hills and in the valleys, very much resembles that on the Del Norte; the only exceptions being a few new and beautiful varieties of the cactus. After leaving our last night's camp, for a mile, the general appearance, width of the valley, and soil, much resemble the most fertile parts of that river. This, so far, has decidedly the best soil, and the fall of the river being greater, makes it more easy to irrigate.

To-day we passed one of the long-sought ruins. I examined it minutely, and the only evidences of handicraft remaining were immense quantities of broken pottery, extending for two miles along the river. There were a great many stones, rounded by attrition of the water, scattered about; and, if they had not occasionally been disposed in lines forming rectangles with each other, the supposition would be that they had been deposited there by natural causes.

October 24.—To-day we laid by to recruit. Although the moon was not in a favourable position, I availed myself of the opportunity to get a few lunar distances; 18 circum-meridian altitudes of Beta

Aquarii, and twelve altitudes of Polaris, give for the latitude of the place 31 deg. 44 min. 52 sec. and 8 distances between the moon and Fomalhaut give for the longitude 109 deg. 22 min. 00 sec. We feasted to-day on the blue quail and teal, and at night Sandy came in with a goose. "Signs" of beaver and deer were very distinct; these, with the wolf, constitute the only animals yet traced on the river.

October 25.—The general character of the country is much the same as before represented; but towards camp it broke into irregular and fantastic-looking mountains. A rose-coloured tint was imparted to the whole landscape, by the predominance of red feld-spar. The road became broken and difficult, as it wound its way around two short canons.

We were now approaching the regions made famous in olden times by the fables of Friar Marcos, and eagerly did we ascend every mound, expecting to see in the distance what I fear is but the fabulous "Casa Montezuma." Once, as we turned a sharp hill, the bold outline of a castle presented itself, with the tops of the walls horizontal, the corners vertical, and apparently one front bastioned. My companion agreed with me that we at last beheld this famed building; on we spurred our unwilling brutes; restless for the show, I drew out my telescope, when to my disappointment a clay butte, with regular horizontal seams, stood in the place of our castle; but to the naked eye the delusion was complete. It is not impossible that this very butte, which stands on an imposing height in the centre of a vast amphitheatre of turreted hills, has been taken by the trappers, willing to see, and more especially to report marvellous things, for the "Casa Montezuma." The Indians here do not know the name Aztec. Montezuma is the outward point in their chronology; and as he is supposed to have lived and reigned for all time preceding his disappearance, so do they speak

of every event preceding the Spanish conquest as of the days of Montezuma.

The name, at this moment, is as familiar to every Indian, Puebla, Apache and Navajoe, as that of our Saviour or Washington is to us. In the person of Montezuma, they unite both qualities of divinity and patriot.

We passed the ruins of two villages similar to those of yesterday. The foundation of the largest house seen yesterday was 60 by 20 feet; to-day, 40 by 30. About none did we find any vestiges of the mechanical arts, except the pottery; the stone forming the supposed foundation was rough and unhewn, and some cedar logs were also found about the houses, much decayed, bearing no mark of an edged tool. Except these ruins, of which not one stone remained upon another, no marks of human hands or footsteps have been visible for many days, until to-day we came upon a place where there had been an extensive fire. Following the course of this fire, as it bared the ground of the shrubbery, and exposed the soil, &c. to view, I found what to us was a very great vegetable curiosity, a cactus, 18 inches high, and 18 inches in its greatest diameter, containing 20 vertical volutes, armed with strong spines. When the traveller is parched with thirst, one of these, split open, will give sufficient liquid to afford relief. Several of these cacti were found torn from the earth, and lying in the dry bed of a stream.

These and the mezquite, *prosopis odorata*, and *prosopis glandulosa*, now form the principal growth. Under the name mezquite, the voyageur comprises all the *acacia* and *prosopis* family.

Last night, about nine o'clock. I heard the yell of a wolf, resembling that of a four-months' old pup. In a few minutes there was a noise like distant thunder. "*Stampede!*" shouted a fellow, and in an instant every man was amongst the mules. With one rush

they had broken every rope ; and this morning, when we started, one of our mules was missing, which gave us infinite annoyance. Our party is so economically provided that we could not afford to lose even a mule, and I left four men to look it up, who did not rejoin us till night.

A question arose involving a serious point of mountain law, which differs somewhat from prairie law. One of my party captured a beautiful dun-coloured mule, which was claimed by another party ; the one claiming the prize for having first seen the animal and then catching it with the lasso. The other pleaded ownership of the rope, used as a lasso, as his title. It was settled to the satisfaction of the first.

The mule was one which Carson had left on his way out, and on being asked why he did not claim it, he said it was too young to be useful in packing, and as we now had plenty of beef, it would not be required for food, and he did not care about it.

October 26.—Soon after leaving the camp, the banks of the river became gullied on each side by deep and impassable arroyos. This drove us insensibly to the mountains, until at length we found ourselves some thousand feet above the river, and it was not until we had made sixteen miles that we again descended to it. This distance occupied eight and a half hours of incessant toil to the men, and misery to our best mules. Some did not reach the camp at all, and when the day dawned, one or two who had lost their way, were seen on the side of the mountain, within a few steps of a high precipice, from which it required some skill to extricate them. The men named this pass "the Devil's turnpike," and I see no reason to change it. The whole way was a succession of steep ascents and descents, paved with sharp, angular fragments of basalt and trap. The metallic clink of spurs, and the rattling of the mule shoes, the high black peaks, the deep dark ravines, and the unearthly

looking cacti, which stuck out from the rocks like the ears of Mephistophiles, all favoured the idea that we were now treading on the verge of the regions below. Occasionally a mule gave up the ghost, and was left as a propitiatory tribute to the place. This day's journey cost us some twelve or fifteen mules; one of mine fell headlong down a precipice, and, to the surprise of all, survived the fall.

The barometric height was taken several times to-day. Long and anxious was my study of these mountains, to ascertain something of their general direction and form. Those on the north side swept in something like a regular curve from our camp of last night to the mouth of the San Carlos, deeply indented in two places by the ingress into the Gila of the Prieto (Black) and Azul (Blue) rivers. Those on the south, where we passed, were a confused mass of basalt and trap, and I could give no direction to the axis of maximum elevation. They seemed to drift off to the south-east. Wherever the eye wandered, huge mountains were seen of black, volcanic appearance, of very compact argillaceous limestone, tinged at times with scarlet from the quantities of red feldspar. Through these the Gila (now swift) has cut its narrow way with infinite labour, assisted by the influx of the Prieto, the Azul and San Carlos rivers. As the story goes, the Prieto flows down from the mountains, freighted with gold. Its sands are said to be full of this precious metal. A few adventurers, who ascended this river hunting beaver, washed the sands at night, when they halted, and were richly rewarded for their trouble. Tempted by their success, they made a second trip, and were attacked and most of them killed by the Indians. My authority for this statement is Londeau, who, though an illiterate man, is truthful.

October 27.—After yesterday's work we were obliged to lay by to-day. The howitzers came up

late in the afternoon. They are small, mounted on wheels ten feet in circumference, which stand apart about three feet, and with the assistance of men on foot, are able to go in almost any place a mule can go.

I strolled a mile or two up the San Carlos, and found the whole distance, it has its way in a narrow canon, worn from the solid basalt. On either side, in the limestone under the basalt were immense cavities, which must have been at times the abodes of Indians, and the dens of beasts. The remains of fire and the bones of animals attested this. Near its mouth we found the foundation of a rectangular house, and on a mound adjacent that of a circular building, a few feet in diameter. The ruin was probably that of a shepherd's house, with a circular building adjoining as a look-out, as there was no ground in the neighbourhood which was suited for irrigation. Both these ruins were of round unhewn stones, and the first was surrounded by pieces of broken pottery. Digging a few feet brought us to a solid mass which was most likely a dirt floor, such as is now used by the Spaniards.

In my walk I encountered a settlement of tarantulas; as I approached, four or five rushed to the front of their caves in an attitude of defence. I threw a pebble at them, and it would be hard to imagine, concentrated in so small a space, so much expression of defiance, rage, and ability to do mischief, as the tarantula presents.

Our camp was near an old Apache camp. The carcasses of cattle in every direction betokened it to have been the scene of a festival after one of their forays into the Spanish territory.

The Gila at this place is much swollen by the affluence of the three streams just mentioned, and its cross section here is about 70 feet by 4. The waters

change their colour, and are slightly tainted with salt; indeed, just below our camp there came from the side of an impending mountain, a spring so highly charged with salt as to be altogether unpalatable. Several exquisite ferns were plucked at the spring, and a new green-barked acacia, covering the plains above the river bed, but vegetation generally was very scarce; this is the first camp since leaving the Del Norte, in which we have not had good grass.

At 8h. 40m., a meteor of surpassing splendour started under the constellation Lyra, about 20 degrees above the horizon, and went off towards the south, projected against a black cloud.

The clouds interfered with my observations; but such as they were, 12 altitudes of Polaris, 9 of Alpha Andromedæ, and 9 of Alpha Lyræ, and 16 distances between the moon and Alpha Pegasi, gave the latitude of the camp 23 deg. 53 min. 16 sec, and the longitude 109 deg. 31 min. 34 sec.

October 28.—One or two miles' ride, and we were clear of the Black mountains, and again in the valley of the Gila, which widened out gradually to the base of Mount Graham, abreast of which we encamped. Almost for the whole distance, twenty miles, were found at intervals the remains of houses like those before described. Just before reaching the base of Mount Graham, a wide valley, smooth and level, comes in from the south-east. Up this valley are trails leading to San Bernadino, Fronteras and Tuscooñ. Here also the trail by the Ojo Cavalla comes in, turning the southern abutments of the Black mountains, along which Capt. Cooke is to come with his waggons.

At the junction of this valley with the Gila are the ruins of a large settlement. I found traces of a circular wall 270 feet in circumference. Here also was one circular inclosure of 400 yards. This must have been for defence. In one segment was a triangular

shaped indenture, which we supposed to be a well. Large mezquite now grow in it, attesting its antiquity. Most of the houses are rectangular, varying from 20 to 100 feet front; many were of the form of the present Spanish houses.

Red cedar posts were found in many places, which seemed to detract from their antiquity, but for the peculiarity of this climate, where vegetable matter seems never to decay. In vain did we search for some remnant which would enable us to connect the inhabitants of these long-deserted buildings with other races. No mark of an edge tool could be found, and no remnant of any household or family utensils, except the fragments of pottery which were everywhere strewed on the plain, and the rude corn-grinder still used by the Indians. So great was the quantity of this pottery, and the extent of ground covered by it, that I have formed the idea it must have been used for pipes to convey water. There were about the ruins quantities of the fragments of agate and obsidian, the stone described by Prescott as that used by the Aztecs to cut out the hearts of their victims. This valley was evidently once the abode of busy, hard-working people. Who are they? And where have they gone? Tradition among the Indians and Spaniards does not reach them.

I do not think it improbable that these ruins may be those of comparatively modern Indians, for Vane-gas says; "The father Jacob Sedelmayer, in October, 1744, set out from his mission, (Tubutuma), and after travelling 80 leagues, reached the Gila, where he found six thousand Papagos, and near the same number of Pimos and Coco Maricopas;" and the map which he gives of this country, although very incorrect, represents many Indian settlements and missions on this river. His observations, however, were confined to that part of the Gila river near its mouth.

Great quantities of green-barked acacia grew on

the table-lands, and also the chamiza, wild sage and mezquite; close to the river, cotton-wood and willow. We found, too, amongst other plants, the *eriodictyon Californicum*, several new grasses and a sedge, very few of which have been seen on our journey.

We saw the trail of cannon up the valley very distinct; that of an expedition from Sonora against the Indians, which was made a few years since without any results.

Wherever the river made incisions, was discoverable a metamorphic, close grained, laminated sandstone, and in many places were seen buttes of vitrified quartz, (semiopal).

October 29.—The dust was knee-deep in the rear of our trail; the soil appeared good, but, for whole acres, not the least sign of vegetation was to be seen. Grass was at long intervals, and, when found, burned to a cinder. A subterraneous stream flowed at the foot of Mount Graham, and fringed its base with evergreen. Everywhere there were marks of flowing water, yet vegetation was so scarce and crisp that it would be difficult to imagine a drop of water had fallen since last winter. The whole plain, from 3 to 6 miles wide, is within the level of the waters of the Gila, and might easily be irrigated, as it no doubt was by the former tenants of these ruined houses.

The crimson-tinted Sierra Carlos skirted the river on the north side the whole day, and its changing profiles formed subjects of study and amusement. Sometimes we would trace a Gothic steeple; then a horse; now an old woman's face; and, again, a veritable steamboat; but this required the assistance of a light smoky cloud, drifting to the east, over what represented the chimney stack. Wherever the river abraded its banks, was seen, in horizontal strata, a yellowish argillaceous limestone.

October 30.—Mount Turnbull, terminating in a sharp cone, had been in view down the valley of the

river for three days. To-day about three o'clock, P.M., we turned its base, forming the northern terminus of the same chain in which is Mt. Graham.

Half a mile from our camp last night were other very large ruins, which appeared, as well as I could judge, (my view being obstructed by the thick growth of mezquite), to have been the abode of five or ten thousand souls. The outline of the buildings and the pottery presented no essential difference from those already described. But about eleven miles from the camp, on a knoll, overlooked in a measure by a tongue of land, I found the trace of a solitary house, somewhat resembling that of a field-work *en cremallière*. The inclosure was complete, and the faces varied from ten to thirty feet.

Clouds had been seen hovering over the head of Mount Turnbull; and as we passed, the beds of the arroyos leading from it were found to be damp, showing the marks of recent running water.

Last night, about dusk, one of my men discovered a drove of wild hogs, and this morning we started on their trail, but horse-flesh had now become so precious, that we could not afford to follow any distance from our direction, and although anxious to get a genuine specimen of this animal, we gave up the chase and dropped in the rear of the column. The average weight of these animals is about 100 pounds, and their colour invariably light pepper and salt. Their flesh is said to be palatable, if the musk, which lies near the back part of the spine, is carefully removed.

Many "fresh signs" of Indians were seen, but, as on previous days, we could not catch a glimpse of them. They carefully avoided us. This evening, however, as Robideaux, unarmed, was riding in advance, he emerged suddenly from a cavity in the ground, thickly masqued by mezquite. He had discovered two Indians on horseback, within twenty

yards of him. The interview was awkward to both parties, but Robideaux was soon relieved by the arrival of the head of our column. The Indians were thrown into the greatest consternation; they were tolerably mounted, but escape was hopeless; two more miserable-looking objects I never beheld; their legs (unlike the Apaches we left behind) were large and muscular, but their faces and bodies (for they were naked) were one mass of wrinkles, almost approaching to scales. They were armed with bows and arrows, and one with a quiver of fresh-cut reeds. Neither could they speak Spanish, and the communication was by signs. They were directed to go with us to camp, where they would receive food and clothing; but they resolutely refused, evidently thinking that certain death awaited them, and that it would be preferable to meet it than suffer suspense. The chief person talked all the time in a tongue resembling more the bark of a mastiff, than the words of a human being. Our anxiety to communicate to the tribe our friendly feeling, and more especially our desire to purchase mules, was very great; but they were firm in their purpose not to follow, and much to their surprise, (they seemed incapable of expressing joy,) we left them and their horses untouched.

They were supposed by some to be the Cayotes, a branch of the Apaches, but Londeau thought they belonged to the tribe of Tremblers, who acquired their name from their emotion at meeting the whites.

Observed to-night 12 altitudes of Polaris for latitude, and measured nine lunar distances for longitude.

Lat. 33 deg. 12 min., 10 sec., long. 110 deg. 20 min. 46 sec.

October 31.—To-day we were doomed to another sad disappointment. Reaching the San Francisco

about noon, we unsaddled to refresh our horses and allow time to look up a trail by which we could pass the formidable range of mountains through which the Gila cuts its way, making a deep canon impassable for the howitzers. A yell on the top of a distant hill announced the presence of three well-mounted Indians, and persons were sent out to bring them in. Our mules were now fast failing, and the road before us unknown. These Indians, if willing, could supply us with mules and show us the road. Our anxiety to see the result of the interview was, consequently, very great. It was amusing, and at the same time very provoking. They would allow but one of our party to approach. Long was the talk by signs and gestures ; at length they consented to come into camp, and moved forward about a hundred yards, when a new apprehension seemed to seize them, and they stopped.

They said, as well as could be understood, that the two old men we met yesterday had informed their chief of our presence, and wish to obtain mules ; that he was on his way with some, and had sent them a-head to sound a parley. They were better-looking, and infinitely better-conditioned, than those we met yesterday, resembling strongly the Apaches of the copper-mines, and, like them, decked in the plundered garb of the Mexicans.

The day passed, but no Indians came ; treacherous themselves, they expected treachery in others. At everlasting war with the rest of mankind, they kill at sight all who fall in their power. The conduct of the Mexicans to them is equally bad, for they decoy and kill the Apaches whenever they can. The former governor of Sonora employed a bold and intrepid Irishman, named Kirker, to hunt the Apaches. He had in his employment whites and Delaware Indians, and was allowed, besides a per diem, 100 dollars per scalp, and 25 dollars for a prisoner.

A story is told of one Johnson, an Englishman, an Apache trader, who, allured by the reward, induced a number of these people to come to his camp, and placed a barrel of flour for them to help themselves; when the crowd was thickest of men, women, and children, he fired a six pounder amongst them from a concealed place and killed great numbers.

Thirteen circum-meridian altitudes of Beta Aquarii, and 10 altitudes of Polaris give the latitude of this camp 33 deg. 14 min. 29 sec. The longitude by 12 lunar distances E. and W. is 110 deg. 30 min. 24 sec.

November 1.—No alternative seemed to offer but to pursue Carson's old trail sixty miles over a rough country, without water, and two, if not three days' journey. Under this, in their shattered condition, our mules must sink. We followed the Gila river six or seven miles, when it became necessary to leave it, how long was uncertain. Giving our animals a bite of the luxurious grama on the river banks, we filled every vessel capable of holding water, and commenced the jornada. The ascent was very rapid, the hills steep, and the footing insecure. After travelling five or six miles, ascending all the way, we found trails from various directions converging in front of us, evidently leading to a village or a spring; it proved to be the last. The spring consisted of a few deep holes, filled with delicious water, overgrown with cotton-wood; and, although the grass was not good, we determined to halt for the night, as the howitzers were not yet up, and it was doubtful when we should meet with water again. I took advantage of the early halt to ascend, with the barometer, a very high peak overhanging the camp, which I took to be the loftiest in the Pinon Lano range on the north side of the Gila.

Its approximate height was only 5,724 feet above the sea. The view was very extensive; rugged mountains bounded the entire horizon. Very far to

the north-east was a chain of mountains covered with snow, but I could not decide whether it was the range on the east side of the Del Norte or the Sierras Mimbres. Near the top of this peak the mezcal grew in abundance, and with the stalk of one 25 feet long we erected a flag-staff. Here, too, we found huge masses of the conglomerate before described, apparently as if it had been arrested in rolling from an impending height, but there was no point higher than this for many miles, and the intervening ravines were deep. Lower down we found a large mass of many thousand tons of the finer conglomerate, the shape of a truncated pyramid standing on its smallest base. It appeared so nicely balanced, a feather might have overthrown it. A well-levelled seat of large slabs of red ferruginous sandstone, altered by heat, indicated we were not on untrodden ground. It was the watch-tower of the Apache; from it he could track the valley of the Gila beyond the base of Mount Graham.

At the point where we left the Gila, there stands a cereus six feet in circumference, and so high I could not reach half way to the top of it with the point of my sabre by many feet; and a short distance up the ravine is a grove of these plants, much larger than the one I measured, and with large branches. These plants bear a saccharine fruit much prized by the Indians and Mexicans. "They are without leaves, the fruit growing to the boughs. The fruit resembles the bur of a chestnut, and is full of prickles, but the pulp resembles that of the fig, only more soft and luscious." In some it is white, in some red, and in others yellow, but always of exquisite taste.

On the hills we found a new shrub bearing a delicious nutritious nut, and in sufficient abundance to form an article of food for the Apaches, mezcal, and the fruit of the Agave Americana.

The formation near the mouth of the San Francisco is diluvial, overlaying a coarse-grained highly calcareous sandstone and limestone. The mountains were chiefly of granite with red feldspar, and near our camp was discernible a stratum of very compact argillaceous limestone, dipping nearly vertically to the west.

November 2.—The call to water sounded long before daylight, and we ate breakfast by the light of the moon; the thermometer at 25 deg. As day dawned we looked anxiously for the howitzers, which were beginning to impede our progress very much. My camp was pitched on the opposite side of a ravine, some distance apart from the main camp, the horses were grazing on the hill-side, still beyond and out of sight. We were quietly waiting for further orders, when our two Mexican herdsmen came running into camp, much alarmed and without their arms, exclaiming: "The Indians are driving off the mules!" "To arms!" was shouted, and before I could loosen a pistol from the holster my little party were in full run to the scene of alarm, each with his rifle. On turning the hill we found the horses tranquilly grazing, but the hill overlooking them was lined with horsemen. As we advanced one of the number hailed us in Spanish, saying he wished to have "a talk."

They were Apaches, and it had been for some time our earnest desire to trade with them, and hitherto we had been unsuccessful. "One of you put down your rifle and come to us," said the Spanish-tongued Indian. Londeau, my employe before mentioned, immediately complied: I followed; but before reaching half-way up the steep hill, the Indian espied in my jacket the handle of a large horse-pistol. He told me I must put down my pistol before he would meet me. I threw it aside and proceeded to the top of the hill, where, although he was

mounted and surrounded by six or eight of his own men, armed with rifles and arrows, he received me with great agitation. The talk was long and tedious. I exhausted every argument to induce him to come into camp. His principal fear seemed to be the howitzers, which recalled at once to my mind the story I had heard of the massacre by Johnson. At last a bold young fellow, tired of the parley, threw down his rifle, and with a step that Forrest in Metamora might have envied, strode off towards camp, piloted by Carson. We were about to follow, when the chief informed us it would be more agreeable to him if we remained until his warrior returned.

The ice was now broken ; most of them seeing that their comrade encountered no danger, followed one by one. They said they belonged to the tribe of Pinon Lanos ; that "they were simple in head but true of heart." Presents were distributed ; they promised a guide to pilot us over the mountain, five miles distant, to a spring with plenty of good grass, where they engaged to meet us next day with 100 mules.

The mezcal flourishes here ; and at intervals of half-a-mile or so we found several artificial craters, into which the Indians throw this fruit, with heated stones, to remove the sharp thorns and reduce it to its saccharine state.

I observed last night for latitude and time, and our position is in latitude 33 deg. 14 min. 54 sec., longitude 110 deg. 45 min. 06 sec. Our camp was on the head of a creek, which, after running in a faint stream one hundred yards, disappeared below the surface of the earth. On its margin grew a species of ash unknown in the United States, and the California plaintree, which is also distinct in species from our sycamore.

November 3.—Our expectations were again dis-

appointed ; the Indians came, but only seven mules were the result of the day's labour, not a tenth of the number absolutely required.

Our visitors to-day presented the same motley group we have always found the Apaches. Amongst them was a middle-aged woman, whose garrulity and interference in every trade was the annoyance of Major Swords, who had charge of the trading, but the amusement of the bystanders.

She had on a gauze-like dress, trimmed with the richest and most costly Brussels lace, pillaged, no doubt, from some fandango-going belle of Sonora ; she straddled a fine gray horse, and whenever her blanket dropped from her shoulders, her tawny form could be seen through the transparent gauze. After she had sold her mule, she was anxious to sell her horse, and careered about to show his qualities. At one time she charged at full speed up a steep hill. In this, the fastenings of her dress broke, and her bare back was exposed to the crowd, who ungallantly raised a shout of laughter. Nothing daunted, she wheeled short round with surprising dexterity, and seeing the mischief done, coolly slipped the dress from her arms and tucked it between the seat and the saddle. In this state of nudity, she rode through camp from fire to fire, until, at last, attaining the object of her ambition, a soldier's red flannel shirt, she made her adieu in that new costume.

A boy about twelve years of age, of uncommon beauty, was among our visitors. Happy, cheerful, and contented, he was consulted in every trade, and seemed an idol with the Apaches. It required little penetration to trace his origin from the same land as the gauze of the old woman. We tried to purchase him, but he said it was *long, long*, since he was captured, and that he had no desire to leave his master, who, he was certain, would not sell him for any money. All attempts were vain, and the lad

seemed gratified both at the offer to purchase, and the refusal to sell. Here we found the mountains chiefly of red ferruginous sandstone, altered by heat.

November 4.—Six miles from our camp of last night we reached a summit, and then commenced descending again rapidly towards the Gila, along a deeply canoned valley, the sands of which were black with particles of oxide and peroxide of iron. Near the summit the hills on each side were of old red sandstone, with strata sloping to the south-west at an angle of 25 deg., and under this were strata of black slate and compact limestone, and then granite.

In the ravines we found, at places, a luxuriant growth of sycamore, ash, cedar, pine, nut-wood, mezcal, and some walnut, the edible nut again, Adam's needle, small evergreen oak and cotton-wood, and a gourd, the *cucumis perennis*.

There was every indication of water, but none was procured on the surface; it could no doubt have been found by digging.

The last six or eight miles of our route was down the dry bed of a stream, in a course east of south, and our day's journey did not gain much in the direction of California. It was necessary to ascend the river a mile in search of grass, and then we got but an indifferent supply. Except in the two camps nearest to Mount Turnbull, and the one at the San Carlos, we have never before, since leaving Santa Fe, had occasion to complain of the want of grass.

We encamped in a grove of cacti of all kinds; amongst them the huge pitahaya, one of which was fifty feet high.

The geological formation on this slope of the Pinon Lano mountains was: 1st, Conglomerate of sandstone and pebbles; then red sandstone in layers a foot thick; then granite, very coarse. The depth of the two first was many hundred feet, and in some places

its stratification much deranged. Many large masses of sandstone, with thin seams of vitrified quartz.

In the dry creek down which we travelled, we saw a cave of green sandstone, in which a fire had been built: for what purpose I cannot conjecture, as it was too small to admit a man.

The Apaches gave us to understand that a marauding party of their people were in Sonora. The broad fresh trail of cattle and horses leading up the arroyo, induces the belief that they have returned—successful, of course.

Last night was mild, the thermometer at 63 deg. Fahrenheit; and, what was very unusual here, the heavens were overcast, which prevented my getting the rate of the chronometers.

Although we have had no rain except at Mount Graham, where we had a shower which scarcely sufficed to lay the dust, yet the whole face of the country bears marks of rains, and running water, met with in no other part of our journey. The absence of vegetation will, in some measure, account for the deep incisions made by running water in the earth.

November 5.—The howitzers did not reach camp last night, yet the grass was so bad, and our beds, on the round pebbles everywhere covering the surface of the ground, so uncomfortable, it was determined to move camp.

The Gila now presents an inhospitable look; the mountains of trap, granite, and red sandstone, in irregular and confused strata, but generally dipping sharply to the south, cluster close together; and one ignorant of the ground could not tell from what direction the river came, or in what direction it flowed onwards to its mouth. The valley, not more than 300 feet from base to base of these perpendicular mountains, is deep, and well grown with willow, cotton-wood, and mezquite.

At several places, perpendicular walls of trap dyke

projected from the opposite side of the river, giving the idea that the river waters had once been dammed up, and then liberated by the blow of a giant; for the barrier was shattered—not worn away. In the course of six miles we had crossed and re-crossed the river twice as many times, when we left it by turning abruptly up a dry ravine to the south. This we followed for three miles, and crossed a ridge at the base of Saddle-Back mountain, (so named by us from its resemblance to the outline of a saddle,) and descended by another dry creek to the San Pedro, running nearly north.

The valley of this river is quite wide, and is covered with a dense growth of mezquite, (*acacia prosopis*,) cotton-wood, and willow, through which it is hard to move without being unhorsed. The whole appearance gave great promise, but a near approach exhibited the San Pedro, an insignificant stream a few yards wide, and only a foot deep.

For six miles we followed the Gila. The pitahaya and every other variety of cactus flourished in great luxuriance. The pitahaya, tall, erect, and columnar in its appearance, grew in every crevice from the base to the top of the mountains, and in one place I saw it growing nearly to its full dimensions from a crevice not much broader than the back of my sabre. These extraordinary looking plants seem to seek the wildest and most unfrequented places.

The range of mountains traversed to-day is the same we have been in for some days, and is a continuation of that of Mount Graham, which turns sharply westward from Turnbull's peak, carrying with it the Gila.

Saddle-Back is an isolated peak of red sandstone that has every appearance of having once formed the table-land, being harder than the surrounding surface, having withstood the abrasion of water.

The uplands were covered as usual with mezquite,

chimaza, ephydrae, the shrub with the edible nut, and cactus, of which there was a new and beautiful variety. In the canon we heard in advance of us the crack of a rifle; on coming up we found that old Francisco, one of the guides, had killed a calf, left there, doubtless, by the Apaches.

The dry creek by which we crossed to the San Pedro river was the great highway leading from the mountain fastnesses into the plains of Santa Cruz, Santa Anna, and Tucsoon, frontier towns of Sonora. Along this valley was distinctly marked the same fresh trail, noted yesterday, of horses, cattle, and mules.

The bed of this creek was deeply cut, and turned at sharp angles, forming a zigzag like the bayoux laid by sappers in approaching a fortress, each turn of which (and they were innumerable) formed a strong defensive position. The Apache once in possession of them is secure from pursuit or invasion from the Mexican.

Since the 1st November, we have been traversing, with incredible labour and great expenditure of mule power, the stronghold of these mountain robbers, having no other object in view than making our distance westward; yet here we are at this camp, only five seconds of time west of camp 89, at Disappointment creek, and one minute and four seconds west of our camp at the mouth of San Francisco.

Nature has done her utmost to favour a condition of things which has enabled a savage and uncivilized tribe, armed with the bow and lance, to hold as tributary powers three fertile and once flourishing states, Chihuahua, Sonora, and Durango, peopled by a Christian race, countrymen of the immortal Cortez. These states were at one time flourishing, but such has been the devastation and alarm spread by these children of the mountains, that they are now losing popula-

tion, commerce and manufactures, at a rate, which, if not soon arrested, must leave them uninhabited.

November 6.—For the double purpose of allowing the howitzers to come up, and to recruit our mules, it is decided this shall be a day of rest. The grama is good, but sparsely scattered over the hills, and it is necessary to loosen every animal, and let them graze at will.

We are yet 500 miles from the nearest settlement, and no one surveying our cavalry at this moment would form notions favourable to the success of the expedition.

Except a few saddle mules, the private property of officers, which have been allowed to run loose, every animal in camp is covered with patches, scars, and sores, made by the packs in the unequal motion caused by the ascent and descent of steep hills.

The failure of the Apaches to bring in their mules, was a serious disappointment, and entirely justifies the name given to the creek, where they agreed to meet us. Besides, being the only means of transportation, they are, in extremity, to serve us as food, and the poor suffering creatures before us, give no very agreeable impression of the soup which their meat will furnish. However grave the subject may appear, it is the common source of merriment. All seem to anticipate it as a matter of course, and the constant recurrence of the mind to the idea, will no doubt accustom us to it, and make mule as acceptable as other soup.

In the sandy arroyos where our fires burn, that look as if they had been formed but a year or two since, was broken pottery, and the remains of a large building, similar in form, substance and apparent antiquity to those so often described. Strolling over the hills alone, in pursuit of seed and geological specimens, my thoughts went back to the States, and

when I turned from my momentary aberrations, I was struck most forcibly with the fact that not one object in the whole view, animal, vegetable or mineral, had any thing in common with the products of any State in the Union, with the single exception of the cotton-wood, which is found in the western States, and seems to grow wherever water flows from the vertebral range of mountains of North America; this tree we found growing near the summit of the Pinon Lano range of mountains; indeed, always where a ravine had its origin.

In one view could be seen clustered, the *Larrea Mezicana*, varieties of cacti, green wood, acacia, chamiza, *prosopis odorata*, and a new variety of sedge, and then large open spaces of bare gravel.

The only animal seen were lizards, scorpions, and tarantulas.

I made elaborate observations for time and latitude, and for longitude by measurement of lunar distances. Anxious to observe eclipses of Jupiter's satellites, I determined once more to try the small telescope with which the satellites of Jupiter could just be discerned. I strained my eyes for two nights in succession to see if I could discover the moment of immersion and emersion of I and III satellites of Jupiter, which were visible from our camp. My efforts were fruitless, and the result to myself is a distressing nervous affection of the eye; which may injure the correctness of my other observations of this night.

The resulting latitude of the place is 32 deg. 57 min. 43 sec.

The resulting longitude of the place is 7 hours, 23 min. 19 sec.

Rate of the chronometer 2075, losing 12 min. 7 sec. per day.

The height by barometer 2115 feet above the sea.

The latitude was deduced from 13 circum-meridian altitudes of Beta Aquarii, and 12 altitudes of Polaris.

The longitude from 8 distances between the Alpha Arietis and the moon, 9 of Regulus and the moon, and 5 of Aldebaran and the moon.

November 7.—About two miles from our camp the San Pedro joins the Gila just as the latter leaps from the mouth of the canon. The place of meeting is a bottom three miles wide, seeming a continuation of that of the Gila.

It is principally of deep dust and sand, overgrown with cotton-wood, mezquite, chamiza, willow, and the black willow. In places there are long sweeps of large paving pebbles, filled up with drift-wood, giving the appearance of having been overflowed by an impetuous torrent. The hills on both sides of the river, still high, but now farther off, and covered to the top with soil producing the mezquite and pitahaya, as the day advanced, began to draw in closer, and before it closed, had again contracted the valley to a space little more than sufficient for the river to pass; and at halt, after making seventeen miles, we found ourselves encompassed by hills much diminished in height, but not in abruptness. The road, except the deep dust which occasionally gave way and lowered a mule to his knee, was good, that is, there were no hills to scale. The river was crossed and recrossed four times. At 12 and 14 miles there were good patches of grama, burned quite yellow, but for most of the way, and at our camp, there was little or no grass, and our mules were turned loose to pick what they could of rushes and willow along the margin of the stream.

Wherever the formation was exposed along the river, it was a conglomerate of sandstone, lime and pebbles, with deep caverns.

Nearly opposite our camp of this date, and about one-third the distance up the hill there crops out ore of copper and iron, easily worked, the carbonate of lime and calcareous spar. A continuation of the vein

of ore was found on the side where we encamped, and a large knoll strewed with what the Spaniards call "*guia*," the English of which is "guide to gold."

The night has set in dark and stormy; the wind blows in gusts from the south-west, and the rain falling in good earnest, mingled with the rustling noise of the Gila, which has now become swift and impetuous, produces on us, who have so long been accustomed to a tranquil atmosphere, quite the impress of a tempest. We have been so long without rain as to cease to expect or make provision against it, and the consequence is the greatest difficulty in getting the men to provide coverings for the destructible portion of our rations.

Three Indians hailed us just before reaching camp, and after much parley were brought in. They feasted heartily, and promised to bring in mules. At first they denied having any; but after their appetites were satisfied, their hearts opened, and they sent the youngest of their party to their town, which was at the head of the dry creek of our camp, of the night before last. The fellow went on his way as directed, till he met the howitzers, which so filled him with surprise and consternation that he forgot his mission, and followed the guns to camp in mute wonder. These people are of Pinon Lano (pinon wood) tribe, and we had been told by the Pinoleros (pinole eaters) that the chief of this band had mules.

Flights of geese and myriads of the blue quail were seen, and a flock of turkeys from which we got one.

The river bed, at the junction of the San Pedro, was seamed with tracks of deer and turkey; some "signs" of beaver and one trail of wild hogs.

Our camp was on a flat sandy plain, of small extent, at the mouth of a dry creek, with deep washed banks, giving the appearance of containing at times

a rapid and powerful stream, although no water was visible in the bed. At the junction, a clear, pure stream flowed from under the sand. From the many indications of gold and copper ore at this place, I have named it Mineral creek ; and I doubt not a few years will see flat boats descending the river from this point to its mouth, freighted with its precious ores.

There was a great deal of pottery about our camp, and just above us were the supposed remains of a large Indian settlement, differing very slightly from those already described.

November 8.—The whole day's journey was through a canon, and the river was crossed twelve to fifteen times. The sand was deep, and occasionally the trail much obstructed by pebbles of paving-stone. The willow grew so densely in many places as to stop our progress, and oblige us to look for spots less thickly overgrown, through which we could break.

The precipices on each side were steep ; the rock was mostly granite and a compact sandy limestone, with occasional seams of basalt and trap ; and towards the end of the day, calcareous sandstone, and a conglomerate of sandstone, feldspar, fragments of basalt, pebbles, &c. The stratification was very confused and irregular, sometimes perfectly vertical, but mostly dipping to the south-west, at an angle of 40 deg. Vast boulders of pure quartz at times obstructed our way, and the river, in places, was paved with those of less magnitude.

About two miles from camp, our course was traversed by a seam of yellowish-coloured igneous rock, shooting up into irregular spires and turrets, one or two thousand feet in height. It ran at right angles to the river, and extended to the north, and to the south, in a chain of mountains as far as the eye could reach. One of these towers was capped with a substance, many hundred feet thick, disposed in

horizontal strata of different colours, from deep red to light yellow. Partially disintegrated, and lying at the foot of the chain of spires, was a yellowish calcareous sandstone, altered by fire, in large amorphous masses.

To the west, about a mile below us, and running parallel to the first, is another similar seam, cut through by the Gila, at a great butte, shaped like a house. The top of this butte appears to have once formed the table-land, and is still covered with vegetation. Through both these barriers the river has been conducted by some other means than attrition. Where it passes the first, it presents the appearance of a vast wall, torn down by blows of a trip-hammer.

The latitude of this camp, which is within a mile of the spot where we take a final leave of the mountains, is, by the mean of the observations on north and south stars, Polaris and Beta Aquarii, 33 deg. 05 min. 40 sec.; its longitude, derived by measurement, and also by chronometric difference of meridian between this, and the camp of November 5th, is 111 deg. 13 min. 10 sec. west of Greenwich, and the height of the river at this point above the sea, as indicated by the barometer, 1,751 feet.

At night, for the first time since leaving Pawnee Fork, I was interrupted for a moment in my observations, by moisture collecting on the glass of my horizon-shade, showing a degree of humidity in the atmosphere not before existing. In the States there is scarcely a night where the moisture will not collect on the glass exposed to the air, sufficient in two or three minutes to prevent the perfect transmission of light.

November 9.—The effect of last night's dampness was felt in the morning, for, although the thermometer was only 37 deg. the cold was more sensible than in the dry regions at 25 deg.

We started in advance of the command to explore the lower belt of mountains by which we were encompassed. The first thing we noticed in the gorge was a promontory of pitch-stone, against which the river impinged with fearful force, for it was now descending at a rapid rate. Mounting to the top of the rock, on a beautiful table, we found sunk six or eight perfectly symmetrical and well-turned holes, about ten inches deep and six or eight wide at top; near one, in a remote place was a pitch-stone, well turned, and fashioned like a pestle. These could be nothing else than the corn-mills of long extinct races. Above this bed of pitch-stone, a butte of calcareous sandstone shot up to a great height, in the seams of which were imbedded beautiful crystals of quartz. Turning the sharp angle of the promontory, we discovered a high perpendicular cliff of calcareous spar and baked argillaceous rock, against which the river also butted, seamed so as to represent distinctly the flames of a volcano. On the side of the river opposite the igneous rocks, the butte rose in perpendicular and confused masses.

This chain continued, not parallel, as I supposed, to the first described barrier, but circled round to the east, and united with it. It also united on the north side, forming a basis three or four miles in diameter, in which we encamped last night. Except a few tufts of *Larrea Mexicana*, these hills were bare of vegetation. Away off to the south, and bordering on the banks of the river, covering the surface of the ground for one or two feet, was an incrustation of black cellular lava or basalt, like that seen about the Raton. Nothing more was wanted to give the idea of an immense extinct volcano. Through the centre of the crater the Gila now pursues its rapid course.

The Gila at this point, released from its mountain barrier, flows off quietly at the rate of three miles an hour into a wide plain, which extends south almost as

far as the eye can reach. Upon this plain mezquite, chamizo, the green acacia, prosopis, artemisia, obione canescens, and pitahaya, were the only vegetation. In one spot only we found a few bunches of grass; more than four-fifths of the plain was destitute of vegetation; the soil, a light-brown, loose sandy earth, I supposed contained something deleterious to vegetation.*

We made our noon halt at the grass patch. At this place were the remains of an immense Indian settlement; pottery was everywhere to be found, but the remains of the foundations of the houses were imbedded in dust. The outlines of the zequias, by which the soil was irrigated, were sometimes quite distinct.

The soil was moist, and wherever the foot pressed the ground the salts of the earth effloresced, and gave it the appearance of being covered with frost. In this way the numberless tracks of horses and other animals, which had at times traversed the plains, were indelible, and could be traced for great distances, by the eye, in long white seams.

We found fresh trails of horses, which might be those of General Castro, or the Indians. When leaving California, Castro's determination, as we learn, was to go to Sonora, beat up recruits, and return. Our route might easily be reached, for we are now marching along a road everywhere accessible, and within three days' march of the settlements of Sonora and the fort at Tucson, said to be regularly garrisoned by Mexican soldiers.

We passed the deserted lodges of Indians, and, at one place, remote from the lodges, we saw thirteen

* A specimen of this soil was submitted to Professor Fraser, who says: "It is a light brown, loose sandy earth containing scarcely anything soluble in water, the solution giving only faint indications of common salt and carbonate of lime. A very small portion of iron pyrites is also contained in it, but I imagine its want of fertility may more properly be attributed to its deficiency in organic matter."

poles set up in a sort of incantation formula; twelve on the circumference of a circle, twenty feet in diameter, and one in the centre. Radii were drawn on the ground from the centre pole to each one in the periphery of the circle. It was the figuring of some medicine man of the Apaches or Pimos, we could not tell which, for it was on neutral ground, about the dividing line of the possessions claimed by each.

After leaving the mountains all seemed for a moment to consider the difficulties of our journey at an end. The mules went off at a frolicsome pace, those which were loose contending with each other for precedence in the trail. The howitzers, which had nearly every part of their running gear broken and replaced, were, perhaps, the only things that were benefitted by the change from the mountains to the plains. These were under the charge of Lieutenant Davidson, whose post has been no sinecure. In overcoming one set of difficulties we were now to encounter another. In leaving the mountains we were informed that we bade adieu to grass, and our mules must henceforth subsist on willow, cottonwood, and the long green ephedra.

November 10.—The valley on the southern side of the Gila still grows wider. Away off in that direction, the peaks of the Sonora mountains just peep above the horizon. On the north side of the river, and a few miles from it, runs a low chain of serrated hills. Near our encampment, a corresponding range draws in from the south-east, giving the river a bend to the north. At the base of this chain is a long meadow, reaching for many miles south, in which the Pimos graze their cattle; and along the whole day's march were remains of zequias, pottery, and other evidences of a once densely populated country. About the time of the noon halt, a large pile, which seemed the work of human hands, was seen to the

left. It was the remains of a three-story mud house, 60 feet square, pierced for doors and windows. The walls were four feet thick, and formed by layers of mud, two feet thick. Stanly made an elaborate sketch of every part; for it was, no doubt, built by the same race that had once so thickly peopled this territory, and left behind the ruins.

We made a long and careful search for some specimens of household furniture, or implements of art, but nothing was found except the corn-grinder, always met with among the ruins of the plains. The marine shell, cut into various ornaments, was also found here, which shows that these people either came from the sea-coast or trafficked there. No traces of hewn timber were discovered; on the contrary, the sleepers of the ground-floor were round and unhewn. They were burnt out of their seats in the wall to the depth of six inches. The whole interior of the house had been burnt out, and the walls much defaced. What was left bore marks of having been glazed, and on the wall in the north room of the second story were traced the following hieroglyphics. [Lost.]

Where we encamped, eight or nine miles from the Pimos village, we met a Maricopo Indian, looking for his cattle. The frank, confident manner in which he approached us, was in strange contrast with that of the suspicious Apache. Soon six or eight of the Pimos came in at full speed. Their object was to ascertain who we were, and what we wanted. They told us the fresh trail we saw up the river was that of their people, sent to watch the movements of their enemies, the Apaches. Being young, they became much alarmed on seeing us, and returned to the town, giving the alarm that a large body of Apaches were approaching.

Their joy was unaffected at seeing we were Americans, and not Apaches. The chief of the

guard at once dispatched news to his chief, of the result of his reconnoissance. The town was nine miles distant, yet in three hours, our camp was filled with Pimos loaded with corn, beans, honey, and zandias (water-melons). A brisk trade was at once opened. This was my observing night; but the crowd of Indians was great, and the passing and re-passing at full speed so continuous, that I got an indifferent set of observations.

The camp of my party was pitched on the side nearest the town, and we saw the first of these people and their mode of approach. It was perfectly frank and unsuspicuous. Many would leave their packs in our camp and be absent for hours, theft seeming to be unknown among them. With the mounted guard, which first visited us, was a man on foot, and he appeared to keep pace with the fleetest horse. He was a little out of breath when he reached us, but soon recovering, told us he was the interpreter to Juan Antonio Llunas, chief of the Pimos.

We were taking some refreshments at the time, and invited him to taste of them. The effect was electric; it made his bright, intelligent eye flash, and loosened his tongue. I asked him, among other things, the origin of the ruins of which we had seen so many; he said, all he knew, was a tradition amongst them, "that in by-gone days, a woman of surpassing beauty resided in a green spot in the mountains near the place where we were encamped. All the men admired and paid court to her. She received the tributes of their devotion, grain, skins, &c., but gave no love or other favour in return. Her virtue, and her determination to remain unmarried were equally firm. There came a drought which threatened the world with famine. In their distress, people applied to her, and she gave corn from her stock, and the supply seemed to be endless.

Her goodness was unbounded. One day, as she was lying asleep with her body exposed, a drop of rain fell upon her stomach, which produced conception. A son was the issue, who was the founder of a new race which built all these houses."

I told the interpreter repeatedly, he must go and report to the general, but his answer was, "let me wait till I blow a little." The attraction was the aguardiente. At length he was prevailed on to go to head-quarters, leaving at our camp his bows and arrows and other matters, saying he would return and pass the night with us.

November 11.—Leaving the column, a few of us struck to the north side of the river, guided by my loquacious friend, the interpreter, to visit the ruins of another Casa Montezuma. In the course of the ride, I asked him if he believed the fable he had related to me last night, which assigned an origin to these buildings. "No," said he, "but most of the Pimos do. We know, in truth, nothing of their origin. It is all enveloped in mystery."

The casa was in complete ruins, one pile of broken pottery and foundation stone, of the black basalt, making a mound about ten feet above the ground. The outline of the ground plan was distinct enough.

We found the description of pottery the same as ever; and among the ruins the same sea-shell; one worked into ornaments; also a large bead, an inch and a quarter in length, of bluish marble, exquisitely turned.

We secured to-day our long-sought bird, the inhabitant of the mezquite, indigo blue plumage, with top-knot and long tail. Its wings, when spread, showing a white ellipse.

Turning from the ruins towards the Pimos village, we urged our guide to go fast, as we wished to see as much of his people as the day would permit. He

was on foot, but led at a pace which kept our mules in a trot.

We came in at the back of the settlement of Pimos Indians, and found our troops encamped in a corn-field, from which the grain had been gathered. We were at once impressed with the beauty, order, and disposition of the arrangements for irrigating and draining the land. Corn, wheat, and cotton are the crops of this peaceful and intelligent race of people. All the crops have been gathered in, and the stubbles show they have been luxuriant. The cotton has been picked, and stacked for drying on the tops of sheds. The fields are subdivided, by ridges of earth, into rectangles of about 200 by 300 feet for the convenience of irrigating. The fences are of sticks, wattled with willow and mezquite, and, in this particular, set an example of economy in agriculture worthy to be followed by the Mexicans, who never use fences at all. The houses of the people are mere sheds, thatched with willow and corn-stalks.

With the exception of the chief, Antonio Llunas, who was clad in cast-off Mexican toggery, the dress of the men consisted of a cotton serape of domestic manufacture, and a breech cloth. Their hair was very long, and clubbed up. The women wore nothing but the serape pinned about the loins, after the fashion of Persico's Indian woman on the east side of the Capitol, though not quite so low.

The camp was soon filled with men, women and children, each with a basket of corn, frijoles, or meal for traffic. Many had jars of the molasses expressed from the fruit of the Cereus Giganteus. Beads, red cloth, white domestic, and blankets, were the articles demanded in exchange. Major Swords, who had charge of the trading duty, pitched a temporary awning, under which to conduct the business, which had scarcely commenced before this place formed a

perfect menagerie, into which crowded with eager eyes, Pimos, Maricopas, Mexicans, French, Dutch, English, and Americans. As I passed on to take a peep at the scene, naked arms, hands, and legs protruded from the awning. Inside there was no room for bodies, but many heads had clustered into a very small space, filled with different tongues and nations. The trade went merrily on, and the conclusion of each bargain was announced by a grunt and a joke, sometimes at the expense of the quarter-master, but oftener at that of the Pimos.

November 12.—We procured a sufficiency of corn, wheat, and beans from the Pimos, but only two or three bullocks, and neither horses nor mules. They have but few cattle, which are used in tillage, and apparently all steers, procured from the Mexicans. Their horses and mules were not plenty, and those they possessed were prized extravagantly high. One dashing young fellow, with ivory teeth and flowing hair, was seen coming into our camp at full speed, on a wild unruly horse, that flew from side to side as he approached, alarmed at the novel apparition of our people. The Maricopa, for he was of that tribe, was without saddle or stirrups, and balanced himself to the right and to the left with such ease and grace as to appear part of his horse. He succeeded in bringing his fiery nag, into the heart of the camp. He was immediately offered a very advantageous trade by some young officer. He stretched himself on his horse's neck, caressed it tenderly, at the same time shutting his eyes, meaning thereby that no offer could tempt him to part with his charger.

The general gave a letter to Governor Llunas, stating that he was a good man, and directing all United States troops that might pass in his rear to respect his excellency, his people and their property. Several broken-down mules were left with him to

recruit, for the benefit of Cooke's battalion as it passed along.

To us it was a rare sight to be thrown in the midst of a large nation of what is termed wild Indians, surpassing many of the Christian nations in agriculture, little behind them in the useful arts, and immeasurably before them in honesty and virtue. During the whole of yesterday, our camp was full of men, women, and children, who sauntered amongst our packs, unwatched, and not a single instance of theft was reported.

I rode leisurely in the rear, through the tatched huts of the Pimos; each abode consists of a dome-shaped wicker-work, about six feet high, and from twenty to fifty feet in diameter, thatched with straw or corn-stalks. In front is usually a large arbour, on the top of which is piled the cotton in the pod, for drying.

In the houses were stowed water-melons, pumpkins, beans, corn, and wheat, the three last articles generally in large baskets; sometimes the corn was in baskets covered with earth, and placed on the tops of the domes. A few chickens and dogs were seen, but no other domestic animals, except horses, mules, and oxen. Their implements of husbandry were the axe (of steel), wooden hoes, shovels, and harrows. The soil is so easily pulverized as to make the plough unnecessary.

Several acquaintances, formed in our camp yesterday, were recognized, and they received me cordially, made signs to dismount, and when I did so, offered water-melons and pinole. Pinole is the heart of Indian corn, baked, ground up, and mixed with sugar. When dissolved in water, it affords a delicious beverage; it quenches thirst, and is very nutritious. Their molasses, put up in large jars, hermetically sealed, of which they had quantities, is expressed from the fruit of the *Cereus Giganteus*.

A woman was seated on the ground under the shade of one of the cotton sheds. Her left leg was tucked under her seat, and her foot turned sole upwards; between her big toe and the next, was a spindle about 18 inches long, with a single fly of four or six inches. Ever and anon she gave it a twist in a dexterous manner, and at its end was drawn a coarse cotton thread. This was their spinning jenny. Led on by this primitive display, I asked for their loom by pointing to the thread and then to the blanket girded about the woman's loins. A fellow stretched in the dust, sunning himself, rose up leisurely, and untied a bundle which I had supposed to be a bow and arrow. This little package, with four stakes in the ground, was the loom. He stretched his cloth and commenced the process of weaving.

We travelled $15\frac{1}{2}$ miles, and encamped on the dividing ground between the Pimos and Maricopas. For the whole distance, we passed through cultivated grounds, over a luxuriantly rich soil. The plain appeared to extend in every direction 15 or 20 miles, except in one place about five miles before reaching camp, where a low chain of hills comes in from the south-east, and terminates some miles from the river. The bed of the Gila, opposite the village, is said to be dry; the whole water being drawn off by the zequias of the Pimos for irrigation; but the ditches are larger than is necessary for this purpose, and the water which is not used returns to the bed of the river with little apparent diminution in its volume.

Looking from our camp north, 30 deg. west, you see a great plain with mountains rising in the distance on each side. This prospect had induced some travellers to venture from here in a direct line to Monterey and California, but there is neither grass

nor water on that passage, and thirst and distress overcame, undoubtedly, those who attempted it.

In almost an opposite direction north, 50 deg. east, there is a gap in the mountains through which the Salt river flows to meet the Gila, making with it an acute angle, at a point ten or fifteen miles distant from our camp, bearing north-west. A little north of east, another gap, twenty or thirty miles distant, shows where the Rio San Francisco flows into the Salt river. From the best information I can collect, the San Francisco comes in from the north; its valley is narrow and much canonized: good grass abounds all the way. Le Vancœur, one of my party, came down that river in 1814 with a trapping party of forty-eight men. He states that they were much annoyed the whole way by the Apache Indians, a great many of whom reside on that river. Every night they were fired upon, and an attempt made to stampede their mules. Many traps were stolen, and one of their party, an old man, who had been in the mountains forty-five years, was killed by the Indians in this expedition.

Near the junction of the Gila and Salt rivers, there is a chain of low serrated hills coming in from both sides, contracting the valley considerably. Around the South Spur the Gila turns, making its course in a more southerly direction. To the east, except where the spurs already mentioned protrude, the plain extends as far as the eye can reach. A great deal of the land is cultivated, but there is still a vast portion within the level of the Gila that is yet to be put under tillage. The population of the Pimos and Maricopas together is estimated variously at from three to ten thousand. The first is evidently too low.

This peaceful and industrious race are in possession of a beautiful and fertile basin. Living remote

from the civilized world, they are seldom visited by whites, and then only by those in distress, to whom they generously furnish horses and food. Aguardiente (brandy) is known among their chief men only, and the abuse of this, and the vices which it entails, are yet unknown.

They are without any other religion than a belief in one great and overruling spirit.

Their peaceful disposition is not the result of incapacity for war, for they are at all times enabled to meet and vanquish the Apaches in battle; and when we passed, they had just returned from an expedition in the Apache country to revenge some thefts and other outrages, with eleven scalps and thirteen prisoners. The prisoners are sold as slaves to the Mexicans.

The Maricopas occupy that part of the basin lying between camp 97 and the mouth of the Salt river, and all that has been said of the Pimos is applicable to them. They live in cordial amity, and their habits, agriculture, religion, and manufactures, are the same. In stature they are taller; their noses are more aquiline, and they have a much readier manner of speaking and acting. I noticed that most of the interpreters of the Pimos were of this tribe, and also the men we met with in the spy-guard. Though fewer in number, they appear to be superior in intelligence and personal appearance.

Don Jose Messio is their governor, and, like the governor of the Pimos, holds his office by the appointment of the Mexican government of California. The people have no choice in the selection. Both these Indians are respectable-looking old men, and seemed to be really worthy of the trust reposed in them.

We had not been long in camp before a dense column of dust down the river announced the approach of the Maricopas, some on foot, but mostly on horse-

back. They came into camp at full speed, unarmed, and in the most confident manner, bringing water-melons, meal, pinole, and salt for trade. The salt is taken from the plains; wherever there are bottoms which have no natural drainage, the salt effloresces and is skimmed from the face of the earth. It was brought to us both in the crystallized form, and in the form when first collected, mixed with earth.

My camp was selected on the side towards the village, and the constant galloping of horses rendered it difficult for me to take satisfactory observations, which I was desirous of doing, as it is an important station. When I placed my horizon on the ground, I found that the galloping of a horse five hundred yards off affected the mercury, and prevented a perfectly reflected image of the stars, and it was in vain to hope for these restless Maricopas to keep quiet. News got about of my dealings with the stars, and my camp was crowded the whole time.

The latitude of this camp by such observations as the Maricopas would allow me to make, was 33 deg. 09 min. 28 sec., and the longitude 112 deg. 07 min. 13 sec.

November 13 and 14.—With the morning came the Maricopas women, dressed like the Pimos. They are somewhat taller, and one peculiarity struck me forcibly, that while the men had aquiline noses, those of the women were *retrousses*. Finding the trade in meal had ceased, they collected in squads about the different fires, and made the air ring with their jokes and merry peals of laughter. Mr. Bestor's spectacles were a great source of merriment. Some of them formed the idea that with their aid, he could see through their cotton blankets. They would shrink and hide behind each other at his approach. At length, I placed the spectacles on the nose of an old woman, who became acquainted with their use, and explained it to the others.

We were notified that a long journey was to be made without finding water, (to cut off an elbow in the river,) and the demand for gourds was much greater than the supply. One large gourd cost me four strings of glass beads, which was thought a high price. The interpreter who guided us to the Casa Montezuma, on the north side of the Gila, said that on the Salt river, about a day's journey and a half, there was one of those buildings, complete in all respects, except the floors and roof. He said it was very large, with beautiful glazed walls; that the footsteps of the men employed in building the house could yet be seen in the adobe, and that the impression was that of a naked foot. Whenever a rain comes, the Indians resort to these old houses to look for trinkets and shells of a peculiar green stone, which I think is nothing more than *verde antique*.

At twelve o'clock, after giving our horses a last watering, we started off in a south-western direction to turn the southern foot of the range of hills pointing to the Salt river. Five miles brought us into a grove of the Cereus, which had yielded a plentiful supply of fruit to the Indians. Our way was over a plain of granitic sand ascending gradually, and almost imperceptibly. After leaving the Cereus, there was no growth except the Larrea Mexicana, and occasionally, at long intervals, an acacia or inga.

We travelled till long after dark, and dropped down in a dust-hole near two large green-barked acacias. There was not a sprig of grass or a drop of water, and during the whole night the mules kept up a piteous cry for both.

There was nothing but the offensive Larrea, which even mules will not touch when so hungry as to eat with avidity the dry twigs of all other shrubs and trees. As soon as the moon rose, at 3 A.M., the bugle sounded to horse, and we were up and pursuing our way. A little after sunrise, we had passed

the summit, and were descending towards the Gila. This summit was formed by a range of granite hills running south-east, and standing in pinnacles.

As the sun mounted, the mirage only seen once before since leaving the plains of the Arkansas, now began to distort the distant mountains, which everywhere bounded the horizon into many fantastic shapes. The morning was sharp and bracing, and I was excessively hungry, having given my breakfast, consisting of two biscuits, to my still hungry mule. I was describing to Mr. Warner how much more pleasant it would be to be jogging into Washington after a fox-hunt, with the prospect of a hot breakfast, when up rose to our astonished view, on the north side of the Gila, a perfect representation of the capitol, with dome, wings, and portico, all complete. It remained for full twenty minutes with its proportions and outline perfect, when it dwindled down into a distant butte.

We went on briskly to the Gila, whose course, marked by the green cotton-wood, could be easily traced. It looked much nearer than it really was. We reached it after making forty miles from our camp of yesterday.

Our poor brutes were so hungry they would drink no water, but fell to work on the young willows and cane. After letting them bite a few minutes we moved down the river five miles further, to a large and luxuriant patch of paspalum grass, shaded by the acacia and prosopis.

My eyes becoming sore with dust, I took a large object for my southern star to-night, the planet Saturn. 16 circum-meridian altitudes of Saturn and 9 altitudes of Polaris give the latitude of the camp 35 deg. 59 min. and 22 sec., and the longitude given by the chronometer is 112 deg. 50 min. and 01 sec.

November 15.—In the morning the general found

the mules so much worsted by the 45 miles journey, without food or water, that he is determined to remain for the day. Most of the mules belonging to my party have travelled 1,800 miles almost continuously. Two or three times they have all appeared on the eve of death; but a mule's vitality recuperates when life seems to be almost extinct; so I am in hopes the day's rest will revive them sufficiently to enable them to undertake what will be the most distressing part of the journey. From information collected from the Indians and others, it appears that we shall meet with no more grass from this spot to the settlements, estimated 300 miles distant.

This has been a gloomy day in the dragoon camp. The jornada cost them six or eight mules, and those which have survived give little promise of future service. The howitzers make severe draughts on them. Yesterday, within five miles of the river, Lieutenant Davidson was obliged to hitch his private mules to them. An order has been given to-day to dismount one-half the command and reserve the animals for packing.

From all accounts there is no difficulty in following the route of the river from camp 97 to this place, and the journey is but a trifle longer; I would, therefore, recommend parties in our rear to get a Coco Maricopa guide and keep the river.

The remains of an old zequia crossed our trail, and the plains were covered with broken pottery. About us there are signs of modern Indian tenements, and the zequia may possibly have been the work of their hands. We know the Maricopas have gradually moved from the Gulf of California to their present location, in juxtaposition with the Pimos. They were found so late as the year 1826, at the mouth of the Gila; and Dr. Anderson, who passed from Sonoro to California in 1828, found them, as near as we could reckon

from his notes, about the place we are now encamped in. The shells found to-day were, in my opinion, evidently brought by the Maricopas from the sea. They differ from those we found among the ruins.

Observed for time to-night and obtained the rates of my chronometers; that of chronometer No. 783, 12 sec. per day, showing a very satisfactory consistency in rate since leaving the mountains.

November 16.—The valley on the south side continues wide, and shows continuously the marks of former cultivation. On the north side the hills run close to the river.

After making ten miles we came to a dry creek, coming from a plain reaching far to the south, and then we mounted the table-lands to avoid a bend in the river, made by a low chain of black hills coming in from the south-east. The table-land was strewed with fragments of black basalt, interspersed with agate, chalcedony, vitrified quartz, and carbonate of lime. About the summit was a mound of granite boulders, blackened by augite, and covered with unknown characters; the work of human hands. These have been copied. On the ground near by were also traces of some of the figures, showing some of the hieroglyphics, at least, to have been the work of modern Indians. Others were of undoubted antiquity, and the signs and symbols intended, doubtless, to commemorate some great event. One stone bore on it what might be taken, with a little stretch of the imagination, to be a mastodon, a horse, a dog, and a man. Their heads are turned to the east, and this may commemorate the passage of the aborigines of the Gila on their way south.

Many of the modern symbols are in imitation of the antique, and, doubtless, the medicine men of the present day resort to this mound to invoke their unseen spirits, and work the miracles which enable them to hold their sway amongst their credulous

race. There are many more weird and mysterious-looking places than this to be found along the banks of the Gila, and the first attraction to the modern Indian was, without doubt, the strange characters he saw described.

Some of the boulders appear to have been written and re-written upon so often, it was impossible to get a distinct outline of any of the characters.

We descended into the broad valley of the Gila, skirted on the south side of the table land, black with basalt pebbles, resting on a stratum of the carbonate of lime, upon which the river impinged at every flood, and widened its valley.

The hills on the north side were of red and gray rocks, probably granite, irregular in form, varying from 500 to 1,000 feet. Finding no grass, we loosened our mules among the willows and came.

November 17.—The route to-day was over a country much the same as that described yesterday. Wherever we mounted to the table-lands, to cut off a bend in the river, found them dreary beyond description, covered with blocks of basalt, with a few intervals of dwarf growth of Larrea.

Now and then, a single acacia raised its solitary form, and displayed its verdure in the black expanse. We crossed the dry beds of two creeks with sandy bottoms. Under the crust of basalt are usually sand-stone and conglomerate of pebbles, sand-stone, and lime. This last is easily undermined by the river, and the basalt or lava then caves in.

The bottoms of the river are wide, rich, and thickly overgrown with willow and a tall aromatic weed, and alive with flights of white brant, (wing tipped with black,) geese, and ducks, with many signs of deer and beaver.

At night I heard the songs of the sailors calling the depth of the water, and presently, Williams, Lieutenant Warner's servant, who had been missing

all day, came out of the river with the hind-quarters of a large buck, perfectly intoxicated with his unexpected success. Twelve miles back, he let his mule loose, went in pursuit of deer, and killed a buck. After luggering the whole of it for two miles, he lightened his load by leaving one-half.

We encamped down in one of the deserted beds of the Gila, where the ground was cracked and drawn into blisters. The night was cold, the thermometer at 6, A.M., 20 deg.

Latitude of the camp, 32 deg. 55 min. 52 sec.; longitude of the camp, 113 deg. 25 min. 25 sec.

November 18.—High wind from the north-west all day, showing that there was still a barrier of snow-clad mountains between ourselves and Monterey, which we must turn or scale.

Carson pointed to a flat rock covered with fir, and told that he had slaughtered a fat mule there. The names of several Americans were inscribed on the same rock.

After travelling some ten or twelve miles through the valley, we mounted to the table-land, and, at half-past twelve o'clock, stopped to graze our horses at a little patch of dried spear grass. Leaving this, the ground, as far as the eye could reach, was strewed with the black, shining, well-rounded pebbles. The Larrea even was scarcely seen, and dreariness seemed to mantle the earth. The arroyo by which we descended to the river was cut from a bed of reddish pebbles twenty or thirty feet deep, and, as we neared the river, they were soldered together in a conglomerate, of which lime was the cement.

We saw to-day, on the rocks, other rude carvings of the Indians, but their modern date was apparent.

To-day there was a dead calm, about meridian intensely hot, and the dust rose in volumes as our party advanced.

We found the river spread over a greater surface,

about 100 yards wide, and flowing gently along over a sandy bottom, the banks fringed with cane, willow, and myrtle.

Last night I took an involuntary plunge into it, for my mule sunk in a quicksand, while I was searching for a place to cross my party. To-night I took a swim, but found the waters disagreeably cold.

The chain of broken hills still continued on the north side, and when near our camp of this date, circled in an amphitheatre, with its arch to the north. The basaltic columns, rising in the shape of spires, domes, and towers, gave it the appearance as we approached, of a vast city on the hills. The distance of the crown of this amphitheatre, determined by angulation, is _____ miles, and Francisco informs me, that against its north base the Colorado strikes. So at this point, which is about six miles below our camp of this date, the Gila and Colorado must be near together. The hills and mountains appeared entirely destitute of vegetation, and on the plains could be seen, only at long intervals, a few stunted tufts of *Larrea Mexicana*, and wild wormwood, *artemisia cana*.

November 19.—The table-lands were the same as those described yesterday, but the valley widens gradually, and for most of the way is six or eight miles wide, and the soil excellent. Some remains of former settlements in broken pottery, corn-grinders, &c.; but much fewer in number than above. Nine miles from camp a spur of mountains of an altered silicious sandstone came in from the south-east, sharp as the edge of a case-knife, and shooting into pinnacles. At their base we passed for half a mile over the sharp edges of a red altered sandstone, dipping south-east about 80 deg., indeed nearly vertical.

On this spur was killed a mountain sheep, one of a large flock, from which we named it Goat's spur.

We encamped on an island where the valley is contracted by sand-buttes in what had been recently the bed of the river. It was overgrown with willow, cane, Gila-grass, flag-grass, &c. The pools in the old bed of the river were full of ducks, and all night the swan, brant, and geese, were passing, but they were as shy as if they had received their tuition on the Chesapeake bay, where they are continually chased by sportsmen. The whole island was tremulous with the motion of the mules grazing, and my observations were, therefore, not very satisfactory.

Eleven circum-meridian altitudes of Procyon, and 12 altitudes of Polaris, give the latitude of the camp 32 deg. 43 min. 38 sec.

November 20.—The table lands were of sand, and the bottom of the river constantly received deposits from them, which changed its bed frequently, as might be seen from the growths of cotton-wood marking the old land. Our road, about five miles from last night's camp, was traversed by a spur of coarse-grained granite, underlaid by old red sandstone, dipping some 80 deg. to the south and west. The direction of the spur was nearly parallel to those before noted, north-west and south-east, which is the direction of the axis of the maximum elevation of most of the mountains traversing the course of the Gila.

Our camp was pitched on a little patch of grass two miles from the river; night came on before the horses reached it, and they were without water for twenty-four hours; there was a pond near the camp, but so salt that the horses could not drink it.

At noon, the thermometer was 74 deg., at 6 p. m., 52 deg. and at 6 o'clock the next morning, 19 deg. which has been about the average range of temperature for the last two weeks.

November 21.—To-day we marched only eight and a half miles, and halted for a patch of grama,

which was an agreeable and beneficial change to our mules, which had been living on cane and willow for some days past.

The plains are now almost entirely of sand, and composed of sandy and calcareous loam, with iron pyrites and common salt, covered sparsely with chamiza, *Larrea Mexicana*, and a shrubby species of sage.

I observed at night for latitude and time, and there being two occultations of Jupiter's satellites, I was tempted to observe them with our inferior telescope, which only gave us another proof of its uselessness for the purpose.

November 22.—Mr. Warner and I started before the advance sounded, and climbed the sharp spur of a continuous comb of mountains coming from the south-east, to try if we could see the Colorado of the west. The mountains rose abruptly from the plains, as they mostly do in this region, resembling in appearance large dykes terminating at top in a sharp ridge which a man could, at any part, straddle. They were of hard granite, pepper and salt coloured, traversed by seams of white quartz. This spur gives the river Gila quite a bend to the north, and from that point to its mouth, which we reached at night, the river is straight in its general direction; but its course is crooked and dotted with sand-bars, by incursions from the sand-hills which now flank both its sides. The sand is brought down by the winds from the valley of the Colorado. Its volume seemed, I think, a little diminished, probably absorbed by the sand.

The day was warm, the dust oppressive, and the march, twenty-two miles, very long for our jaded and ill-fed brutes. The general's horse gave out, and he was obliged to mount his mule.

Most of the men were on foot, and a small party, composed chiefly of the general and staff, were a

long way ahead of the straggling column, when, as we approached the end of our day's journey, every man was straitened in his saddle by our suddenly falling on a camp which, from the trail, we estimated at 1,000 men, who must have left that morning. Speculation was rife, but we all soon settled down to the opinion that it was General Castro and his troops; that he had succeeded in recruiting an army in Sonora, and was now on his return to California. Carson expressed the belief that he must be only ten miles below, at the crossing. Our force consisted only of 110 men. The general decided we were too few to be attacked, and must be the aggressive party, and if Castro's camp could be found, that he would attack it the moment night set in, and beat them before it was light enough to discover our force.

The position of our camp was decided, as usual, with reference to the grass. The lives of our animals were nearly as important as our own. It was pitched to-day in a little hollow encircled by a chain of sand-hills, overgrown with mezquite.

The sergeant of the general's guard was behind, his mule having broken down; and when he came in, reported having seen two Indians about five miles back. For a short time we supposed this immense trail was a band of Indians returning from a successful marauding expedition in Sonora or California; but this conjecture was soon dispelled by the appearance of a mounted Mexican on a sand-butte overlooking our camp, who, after taking a deliberate survey, disappeared. The camp was arranged immediately for defence, and a cordon of sentinels stationed on the sand-hills.

The two howitzers did not arrive till nine o'clock, and the officer in charge, Lieutenant Hammond, reported he had seen large fires to the right, apparently five miles distant, on the opposite side of the Gila.

The general said it was necessary for him to know

who occupied the camp, its force, character, and destination.

He ordered me to take my party and fifteen dragoons, for the purpose of reconnoitring. After beating about in the mezquite for some time, we struck a slough of the Gila, where grew some tall willows. Up one of these I sent a dragoon, who saw no fire, but whose ears were gladdened by the neighing of horses. He slipped down the tree much faster than he climbed it, quite enchanted with the hope of exchanging his weary mule for a charger. Instead of reporting what he had seen, he exclaimed, "Yes, sir, there are enough for us all." "Did you see the fires?" "No! but they are all on horses; I heard them neighing, and they cover much ground." He pointed in the direction, and after proceeding a short distance, we all heard distinctly the noise of the horses, indicating a large number.

Silence was enjoined, and we proceeded stealthily along for some time, when a bright fire blazed before us. I halted the guard, and with two dragoons, Londeau and Martinez, proceeded unobserved until a few feet of the fire. Before it stood an armed Mexican. I sent Londeau and Martinez with orders to assume the occupation of trappers, and ascertain whom and what the man guarded. The conference was short; other Mexicans advanced, and I sent in man for man. It was not Castro as we expected, but a party of Mexicans with 500 horses from California, on their way to Sonora for the benefit of Castro.

I took the four principal men to the general, and left a guard to watch the camp and see that no attempt was made to escape. The men were examined separately, and each gave a different account of the ownership and destination of the horses.

The chief of the party, a tall venerable looking man, represented himself to be a poor employe of

several rich men engaged in supplying the Sonora market with horses. We subsequently learned that he was no less a personage than Jose Maria Leguna, a colonel in the Mexican service.

November 23.—We did not move camp to-day, in order to make a refit from last night's capture, and give our mules an opportunity to pick what little grass they could before taking the desert of 90 miles, which lies on the other side of the Colorado, and between us and water.

Warner, Stanly, and myself, saddled up to visit the junction of the Gila and Colorado, which we found due north from our camp, and about a mile and a half distant. The day was stormy, the wind blowing fiercely from the north. We mounted a butte of feldspathic granite, and looking 25 deg. east of north, the course of the Colorado was tracked by clouds of flying sand. The Gila comes into it nearly at right angles, and the point of junction, strangely chosen, is the hard butte through which, with their united forces they cut a canon, and then flow off due magnetic west, in a direction the resultant due to the relative strength of the rivers.

The walls of the canon are vertical and about fifty feet high, and 1,000 feet long. Almost before entering the canon, in descending the Gila, its sea-green waters are lost in the chrome-coloured hue of the Colorado. For a distance of three or four miles below the junction, the river is perfectly straight, and about 600 feet wide; and up at least to this point, there is little doubt that the Colorado is always navigable for steamboats. Above, the Colorado is full of shifting sand-bars, but is, no doubt, to a great extent susceptible of navigation.

The Gila, at certain stages, might be navigated up to the Pimos village, and possibly with small flat boats at all stages of water.

Near the junction, on the north side, are the

remains of an old Spanish church, built near the beginning of the 17th century, by the renowned missionary, Father Kino. The mission was eventually sacked by the Indians, and the inhabitants all murdered or driven off. It will probably yet be the seat of a city of wealth and importance, most of the mineral and fur regions of a vast extent of country being drained by the two rivers. The stone butte through which they have cut their passage is not more than a mile in length. The Gila once flowed to the south, and the Colorado to the north of this butte, and the point of junction was below. What freak of nature united their efforts in forcing the butte, is difficult to say. During freshets, it is probable the rivers now discharge their surplus waters through these old channels. Francisco informs me that the Colorado, seven days' travel up from the butte, continues pretty much as we saw it.

There a canon is reached, impassable for horses or canoes. The country between is settled by the Coyotaros, or wolf-eaters, cochin-ears, dirty fellows, Tontears, or fools, and the Garroteros, or club Indians. These cultivate melons, beans and maize.

On our return we met a Mexican, well mounted and muffled in his blanket. I asked him where he was going; he said to hunt horses. As he passed, I observed in each of his holsters the neck of a bottle, and on his croup a fresh-made sack, with other evidences of a preparation for a journey. Much against his taste I invited him to follow me to camp; several times he begged me to let him go for a moment, that he would soon return. His anxiety to be released increased my determination not to comply with his request. I took him to General Kearney and explained to him the suspicious circumstances under which I had taken him, and that his capture would prove of some importance. He was immediately

searched, and in his wallet was found the mail from California, which was of course opened.

Among the letters was one addressed to General Jose Castro, at Alta, one to Antonio Castro, and others to men of note in Sonora. All suspected of relating to public affairs were read, and we ascertained from them that a counter-revolution had taken place in California, that the Americans were expelled from Santa Barbara, Puebla de los Angeles, and other places; and that Rabideaux, the brother of our interpreter, who had been appointed alcalde by the Americans, was a prisoner in jail. They all spoke exultingly of having thrown off "the detestable Anglo-Yankee yoke," and congratulated themselves that the tri-colour once more floated in California.

Captain Flores was named as the general and governor, pro tem., and the enthusiasm of the people described as overflowing in the cause of emancipation from the Yankee yoke. One letter gave a minute and detailed account of a victory stated to have been obtained over the Americans. It stated that 450 men landed at San Pedro, and were met, defeated, and driven back to the fort at San Pedro. This last was attributed by us to Mexican braggadocio, as it is usual with them to represent their defeats as victories; but that there was a disturbance of a serious kind in the province, we could not doubt, from the uniformity of the accounts on that head. We also learned that the horses captured were in part for General Castro. Nothing more was wanting to legitimize our capture, and Captain Moore was directed to remount his men.

The letters contained precise information, but being dated so far back as the 15th October, left us in great doubt as to the real state of affairs in California, and the Mexicans played their parts so dexterously, it was not in our power to extract the

truth from them. One of the party, who had received some little favour from Carson in California, was well plied with brandy, but all that could be extorted from him was the advice that we should not think of going to the Puebla with our small forces, counsel that our friend soon learned we had not the slightest intention of following.

The position of our camp, about one mile and a half south of the junction of the Colorado and Gila rivers, determined by 12 circum-meridian altitudes of Sirius, 6 of Saturn, and 12 altitudes of Polaris, is latitude 32 deg. 42 min. 09 sec. The longitude by one set of lunar distances, E. and W., 114 deg. 37 min. 09 sec., which agrees with the chronometric determination of the same place, determined by assuming the longitude of San Diego to be 117 deg. 11 min.

The clouds, together with my military duties, interfered with taking a more elaborate set of lunar distances. An inspection of the individual observations for latitude will show that the latitude of the camp may be relied on, but I regret it was not in my power to measure the exact distance of our camp from the mouth of the Gila.

At night passing my arm over the surface of the fur robe in which I was enveloped, electric sparks were discharged in such quantities as to make a very luminous appearance, and a noise like the rattle of a snake.

November 24.—We visited the camp of our Mexican friends, whom the general determined to release, and found there was a woman with the party in the agonies of childbirth. She was at once furnished from our stores with all the comforts we possessed.—This poor creature had been dragged along, in her delicate situation, over a fearful desert.

The captured horses were all wild, and but little adapted for immediate service, but there was rare

sport in catching them, and we saw for the first time the lasso thrown with illimitable skill. It is a saying in Chihuahua that "a Californian can throw the lasso as well with his foot as a Mexican can with his hand," and the scene before us gave us an idea of its truth. There was a wild horse of great beauty, which defied the fleetest horse and the most expert rider. At length a boy of fourteen, a Californian, whose graceful riding was the constant subject of admiration, piqued by repeated failures, mounted a fresh horse, and, followed by an Indian, launched fiercely at the stallion.

His lariat darted from his hand with the force and precision of a rifle-ball, and rested on the neck of the fugitive; the Indian, at the same moment, made a successful throw, but the stallion was too stout for both, and dashed off at full speed, with both ropes flying in the air like wings—the perfect representation of Pegasus. He took a sweep, and followed by his pursuers, came thundering down the dry bed of the river. The lassos were now trailing on the ground, and the gallant young Spaniard, taking advantage of the circumstance, stooped from his flying horse, and caught one in his hand. It was the work of a moment to make it fast to the pommel of his saddle, and by a short turn of his own horse, he threw the stallion a complete somerset, and the game was secure.

We travelled over a sandy plain a few miles, and descended into the wide bed of the Colorado, overgrown thickly with mezquite, willow, and cottonwood; after making about ten miles, we encamped abreast of the ford on a plateau covered with young willows, of which our horses were to lay in a sufficient supply to last them over the desert. Since writing the above, we have found a good patch of grass, and our people have been ordered to cut a ration for each mule to carry along.

The night was excessively cold and damp, and in

the morning our blankets were covered with a little dew. For the first time, the bugle-calls were distinctly reverberated, showing the atmospheric change as we approach the coast and descend into the neighbourhood of the sea level. In New Mexico, even when surrounded by hills and perpendicular walls, the report of firearms, and the sound of the bugle, were unattended by any distinct echo. The reports were sharp and unpleasant, not rounded, as here, by the reverberation.

The country, from the Arkansas to this point, more than 1,200 miles, in its adaptation to agriculture, has peculiarities which must for ever stamp itself upon the population which inhabits it. All of North Mexico, embracing New Mexico, Chihuahua, Sonora, and the Californias, as far north as the Sacramento, are, as far as the best information goes, the same in the physical character of its surface, and differ but little in climate or products.

In no part of this vast tract can the rains from heaven be relied upon, to any extent, for the cultivation of the soil. The earth is destitute of trees, and in great part also of any vegetation whatever.

A few feeble streams flow in different directions from the great mountains, which in many places traverse this region. These streams are separated, sometimes by plains, and sometimes by mountains, without water and without vegetation, and may be called deserts, so far as they perform any useful part in the sustenance of animal life.

The cultivation of the earth is therefore confined to those narrow strips of land which are within the level of the waters of the streams, and wherever practised in a community with any success, or to any extent, involves a degree of subordination, and absolute obedience to a chief, repugnant to the habits of our people.

The chief who directs the time and the quantity of

the precious irrigating water must be implicitly obeyed by the whole community. A departure from his orders, by the waste of water, or unjust distribution of it, or neglect to make the proper embankments, may endanger the means of subsistence of many people. He must therefore be armed with power to punish promptly and immediately.

The profits of labour are too inadequate for the existence of negro slavery. Slavery, as practised by the Mexicans, under the form of peonage, which enables their master to get the services of the adult while in the prime of life, without the obligations of rearing him in infancy, supporting him in old age, or maintaining his family, affords no data for estimating the profits of slave-labour as it exists in the United States.

No one who has ever visited this country, and who is acquainted with the character and value of slave-labour in the United States, would ever think of bringing his own slaves here with any view to profit, much less would he purchase slaves for such a purpose. Their labour here, if they could be retained as slaves, among peons, nearly of their own colour, would never repay the cost of transportation, much less the additional purchase money.

I made many inquiries as to the character of the vast region of country embraced in the triangle, formed by the Colorado of the west, the Del Norte, and the Gila ; and the information collected, will, at some future time, be thrown into notes for the benefit of future explorers, but are not given in this work, as I profess to write only of what I saw.

From all that I learn, the country does not differ materially in its physical character from New Mexico, except, perhaps, being less denuded of soil and vegetation. The sources of the Salinas, the San Francisco, Azul, San Carlos, and Prieto, tributaries of the Gila, take their rise in it. About their head waters,

and occasionally along their courses, are presented sections of land capable of irrigation.

The whole extent, except on the margin of streams, is said to be destitute of forest trees. The Apaches, a very numerous race, and the Navajoes, are the chief occupants, but there are many minor bands, who, unlike the Apaches and Navajoes, are not nomadic, but have fixed habitations. Amongst the most remarkable of these are the Soones, most of whom are said to be Albinos. The latter cultivate the soil, and live in peace with their more numerous and savage neighbours.

Departing from the ford of the Colorado, in the direction of Sonora, there is a fearful desert to encounter. Alter, a small town, with a Mexican garrison, is the nearest settlement.

All accounts concur in representing the journey as one of extreme hardship, and even peril. The distance is not exactly known, but it is variously represented at from four to seven days' journey. Persons bound for Sonora from California, who do not mind a circuitous route, should ascend the Gila as far as the Pimos village, and thence penetrate the province by way of Tucsoon.

November 25.—At the ford, the Colorado is 1,500 feet wide, and flows at the rate of a mile and a half per hour. Its greatest depth in the channel, at the ford where we crossed, is four feet. The banks are low, not more than four feet high, and judging from indications, sometimes, though not frequently, overflowed. The general appearance at this point is much like that of the Arkansas, with its turbid waters, and many shifting sand islands.

The ford is entered at the lower extremity of the plateau upon which we encamped, and leads down the river, crossing three sand islands, which we sketched; but as they are constantly shifting, the sketch will perhaps afford no guide to the traveller,

and may even lead him into error. They are, therefore, not furnished. The ford is narrow and circuitous, and a few feet to the right or left sets a horse afloat. This happened to my own horse.

Report makes the distance of the mouth of the Colorado, from the crossing, eighty miles, but unless the river is very crooked, this cannot be: Lieutenant Hardy, of the royal navy, determined the mouth to be in latitude 31 deg. 51 sec. north, and longitude 114 deg. 1 min.

The growth on the river bottom is cotton-wood, willow of different kinds, *equisetum hyemale*, (scouring rush,) and a nutritious grass in small quantities.

After crossing, we ascended the river three-quarters of a mile, where we encountered an immense sand drift, and from that point until we halted, the great highway between Sonora and California lies along the foot of this drift, which is continually but slowly encroaching down the valley. *Prosopis glandulosa*, wild sage, and ephedra, compose the growth; the first is luxuriant.

We halted at a dry arroyo, a few feet to the left of the road leading into the Colorado, where there was a hole five or six feet deep, which, by deepening, furnished sufficient water for the men.

We are yet, by the indications of the barometer, but 20 or 30 feet above the river, and where the sands from the desert to the north have not encroached, the soil appears good. There are remains of zequias about five miles back, and where we halted, the remains of Indian settlements, but it is probable the water has been cut off by the drift, and cannot now be brought from the river above.

I made observations at night for time and latitude, and found the position of the place to be north latitude 32 deg. 40 min. 22 sec., and longitude 114 deg. 56 min. 28 sec. west of Greenwich.

We tied our animals to the mezquite trees, (*Prosopis glandulosa*,) and remarking on the way that they showed an inclination to eat the bean of this plant, sent the men to collect them; the few gathered were eaten with avidity.

November 26.—The dawn of day found every man on horseback and a bunch of grass from the Colorado tied behind him on the cant of his saddle. After getting well under way, the keen air at 26 deg. Fahrenheit, made it most comfortable to walk. We travelled four miles along the sand-butte, in the same direction as yesterday, about south 75 deg. west, (magnetic); we mounted the buttes and found, after a short distance, a firmer footing, covered with fragments of lava, rounded by water, and many agates. We were now fairly on the desert.

Our course now inclined a few degrees more to the north, and at 10, A. M., we found a large patch of grama, where we halted for an hour, and then pursued our way over the plains covered with fragments of lava, traversed at intervals by sand-buttes, until 4, P. M., when after travelling 24 miles, we reached the Alamo or cotton-wood. At this point, the captured Spaniards informed us, that failing to find water, they had gone a league to the west, in pursuit of their horses, where they found a running stream. We accordingly sent parties to search, but neither the water nor their trail could be found.

Neither was there any cotton-wood at the Alamo, as its name would signify; but Francisco said that it was nevertheless the place, that tree having probably been covered by the encroachments of the sand, which here terminates in a bluff 40 feet high, making the arc of a great circle convexing to the north.

Descending this bluff, we found in what had been the channel of a stream, now overgrown with a few ill-conditioned mesquite, a large hole where persons had evidently dug for water. It was necessary to

halt to rest our animals, and the time was occupied in deepening this hole, which after a strong struggle, showed signs of water. An old champagne basket, used by one of the officers, as a pannier, was lowered in the hole, to prevent the crumbling of the sand. After many efforts to keep out the caving sand, a basket-work of willow twigs effected the object, and much to the joy of all, the basket, which was now 15 or 20 feet below the surface, filled with water. The order was now given for each mess to draw a camp-kettle of water, and Captain Turner was placed in charge of the spring, to see fair distribution.

When the messes were supplied, the firmness of the banks gave hopes that the animals might be watered, and each party was notified to have their animals in waiting ; the important business of watering then commenced, upon the success of which depended the possibility of their advancing with us a foot further.

Two buckets for each animal were allowed. At 10, A. M., when my turn came, Captain Moore had succeeded, by great exertions, in opening another well, and the one already opened began to flow more freely, in consequence of which, we could afford to give each animal as much as it could drink. The poor brutes, none of which had tasted water in forty-eight hours, and some not for the last sixty, clustered round the well and scrambled for precedence.

At 12 o'clock I had watered all my animals, thirty-seven in number, and turned over the well to Captain Moore.

The animals still had an aching void to fill, and all night was heard the munching of sticks, and their piteous cries for more congenial food.

November 27 and 28.—To-day we started a few minutes after sunrise. Our course was a winding one, to avoid the sand-drifts. The Mexicans had informed us that the waters of the salt lake, some

thirty or forty miles distant, were too salt to use, but other information led us to think the intelligence was wrong. We accordingly tried to reach it; about 3, P. M., we disengaged ourselves from the sand and went due (magnetic) west, over an immense level of clay detritus, hard and smooth as a bowling green.

The desert was almost destitute of vegetation, now and then an Ephedra, *Oenothera*, or bunches of *Aristida* were seen, and occasionally the level was covered with a growth of *Obione canescens* and a low bush with small oval plaited leaves, unknown.

The heavy sand had proved too much for many horses and some mules, and all the efforts of their drivers could bring them no farther than the middle of this dreary desert. About 8 o'clock, as we approached the lake, the stench of dead animals confirmed the reports of the Mexicans and put to flight all hopes of our being able to use the water.

The basin of the lake, as well as I could judge at night, is about three-quarters of a mile long and half a mile wide. The water had receded to a pool, diminished to one half its size, and the approach to it was through a thick soapy quagmire. It was wholly unfit for man or brute, and we studiously kept the latter from it, thinking that the use of it would but aggravate their thirst.

One or two of the men came in late, and rushing to the lake, threw themselves down and took many swallows before discovering their mistake; but the effect was not injurious except that it increased their thirst.

A few mezquite trees and a chenopodiaceous shrub bordered the lake, and on these our mules munched till they had sufficiently refreshed themselves, when the call to saddle was sounded, and we groped silently our way in the dark. The stoutest animals now began to stagger, and when day dawned, scarcely a man was seen mounted.

With the sun rose a heavy fog from the south-east, no doubt from the gulf, and sweeping towards us, enveloped us for two or three hours, wetting our blankets and giving relief to the animals. Before it had dispersed we came to a patch of sun-burned grass.

When the fog had entirely dispersed we found ourselves entering a gap in the mountains, which had been before us for four days. The plain was crossed, but we had not yet found water. The first valley we reached was dry, and it was not till 12 o'clock, M., that we struck the Cariso (cane) creek, within half a mile of one of its sources, and although so close to the source, the sands had already absorbed much of its water, and left but little running. A mile or two below, the creek entirely disappears.

We halted, having made fifty-four miles in two days, at the source, a magnificent spring twenty or thirty feet in diameter, highly impregnated with sulphur, and medicinal in its properties. No vessel could be procured to bring home some of the water for analysis, but I scraped a handful of the salt which had effloresced to the surface of the adjacent ground, and Professor Frazer finds it to contain sulphate of lime, and magnesia, and chloride of sodium.

The spring consisted of a series of smaller springs or veins, varying in temperature from 68 deg. to 75 deg. This variation, however, may have been owing to the different exposures of the fountains in which the thermometer was immersed. The growth was cane, rush, and a coarse grass, such as is found on the marshes near the sea shore.

The desert over which we had passed, ninety miles from water to water, is an immense triangular plain, bounded on one side by the Colorado, on the west by the Cordilleras of California, the cost chain of mountains which now encircles us, extending from the

Sacramento river to the southern extremity of Lower California, and on the north-east by a chain of mountains, a continuation of the same spur noted on the 22d as running southeast and northwest. It is chiefly covered with floating sand, the surface of which in various places is white with diminutive spinelas, and everywhere over the whole surface is found the large and soft muscle shell.

I have noted the only two patches of grass found during the "jornada." There were scattered, at wide intervals, the *Palafoxia linearis*, *Atriplex*, *Encelia farinosa*, *Daleas*, *Euphorbias*, and *Simsia*, described by Dr. Torrey as a new species.

The southern termination of this desert is bounded by the Tecate chain of mountains and the Colorado; but its northern and eastern boundaries are undefined, and I should suppose from the accounts of trappers, and others, who have attempted the passage, from California to the Gila by a more northern route, that it extends many days' travel beyond the chain of high mountains which bound the horizon in that direction.

The portal to the mountains through which we passed was formed by immense buttes of yellow clay and sand, with large flakes of mica and seams of gypsum. Nothing could be more forlorn and desolate in appearance. The gypsum had given some consistency to the sand-buttles, which were washed into fantastic figures. One ridge formed apparently a complete circle, giving it the appearance of a crater; and although some miles to the left I should have gone to visit it, supposing it to be a crater, but my mule was sinking with thirst, and water was yet at some distance. Many animals were left on the road to die of thirst and hunger, in spite of the efforts of the men to bring them to the spring. More than one was brought up, by one man tugging at the halter and another pushing up the brute, by placing his

shoulder against its buttocks. Our most serious loss, perhaps, was that of one or two fat mares and colts brought with us for food ; for before leaving camp, Major Swords found in a concealed place one of the best pack-mules slaughtered, and the choice bits cut from his shoulders and flanks, stealthily done by some mess less provident than others.

I observed at night for time and latitude : for longitude by measuring 18 distances between the moon and Aldebaran, and the moon and Fomalhaut.

Latitude 32 deg. 52 min. 33 sec. Longitude 116 deg. 06 min. 09 sec.

November 29.—The grass at the spring was any thing but desirable for our horses, and there was scarcely a ration left for the men. This last consideration would not prevent our giving the horses a day's rest wherever grass could be found. We followed the dry sandy bed of the Cariso nearly all day, at a snail's pace, and at length reached the "little pools" where the grass was luxuriant but very salt. The water strongly resembled that at the head of the Cariso creek, and the earth, which was very tremulous for many acres about the pools, was covered with salt.

This valley is at no point more than half a mile wide, and on each side are mountains of gray granite and pure quartz, rising from 1,000 to 3,000 feet above it.

A few miles from the spring called Ojo Grande, at the head of the creek, several scattered objects were seen projected against the cliffs, hailed by the Florida campaigners, some of whom were along, as old friends. They were cabbage-trees, and marked the locale of a spring and a small patch of grass. We found also to-day, in full bloom, the *Fouquiera spinosa*, a rare and beautiful plant ; the *Plantago*, new to our flora, a new species of *Eriogonum* very remarkable for its

extremely numerous long hair-like fruit-stalks and minute flowers.

We rode for miles through thickets of the centennial plant, *Agave Americana*, and found one in full bloom. The sharp thorns terminating every leaf of this plant were a great annoyance to our dismounted and wearied men, whose legs were almost bare. A number of these plants were cut by the soldiers, and the body of them used as food. The day was intensely hot, and the sands deep; the animals, inflated with water and rushes, gave way by scores; and, although we advanced only sixteen miles, many did not arrive at camp until 10 o'clock at night. It was a feast-day for the wolves, which followed in packs close on our track, seizing our deserted brutes, and making the air resound with their howls as they battled for the carcasses.

The water comes to the surface in pools at this place. It is a valley surrounded by high bleak mountains destitute of vegetation. The mountains are of a micaceous granite seamed with volcanic matter. The grass, which is coarse, extends for a mile or two along the valley.

A heavy cloud overhung the mountains to the west, and the wind blew a hurricane from that quarter; yet our zenith was never obscured, except for a minute at a time by a fleeting cloud detached from the great bank. A horse was killed for food, which was eaten with great appetite, and all of it consumed.

November 30.—Notwithstanding the water was saltish and in pools, and the grass unfavourable to the horses, yet we were compelled to avail ourselves of it for a day to recruit. The day and night were very unpleasant, from the high wind which came over the snow-clad mountains to the west. The ground, too, was tremulous, and my observations for time, by which I hoped to obtain the rate of my chronometers, were not such as I could desire.

December 1.—We ascended the valley, now destitute of both grass and water, to its termination, and then descended to the deserted Indian village of San Felippe. The mountains on either side are lofty, I suppose from 3,000 to 5,000 feet high, and those to the west incrusted on the top with snow and icicles. Our camp was in a long field of grass, three or four miles in extent, through which a warm stream flowed and drained through a canon to the north, abreast of the village. We went to the barren hills and collected the dry sage and scrub mezquite, with which we made a feeble fire. The *Larrea Mexicana* grew here also, but it is unfit for fuel.

About nine miles from the camp, we passed the summit which is said to divide the waters flowing into the Colorado from those flowing into the Pacific, but I think it is a mistake. The pass is much below the peaks on either side, and the height gives no indication of the elevation of the range, and, indeed, the barometric reading was but an indifferent index of the height of the pass, as the day was stormy. We are still to look for the glowing pictures drawn of California. As yet, barrenness and desolation hold their reign. We longed to stumble upon the rancharias, with their flocks of fat sheep and cattle. Meat of horses may be very palatable when fat, but ours are poor and tough, and it is hard to satisfy the cravings of hunger with such indifferent food.

Early in the day's march, we met two Indians, a man and a woman; they could give us no information of what was passing on the western side of the mountains. They continued on with the utmost indifference, exhibiting no signs of fear or astonishment at this sudden apparition of ragged blue-coats. They had fine athletic figures, but were prematurely wrinkled from poverty and exposure to cold.

December 2 and 3.—We commenced to ascend another "divide," and as we approached the summit,

the narrow valley leading to it was covered with timber and long grass. On both sides, the evergreen oak grew luxuriantly, and, for the first time since leaving the States, we saw what would even there be called large trees. Emerging from these, we saw in the distance the beautiful valley of the Aqua Caliente, waving with yellow grass, where we expected to find the rancheria owned by an American named Warner.

As we passed, crows and wolves were seen in numbers.

Leaving the valley, we ascended the hills to the north covered with mezquite, estafiat, &c. Our progress was slow and painful; we thought Warner's rancheria never would open on our eager sight, when suddenly it burst upon our view at the foot of the hill. We were mistaken for Indians, and soon were seen horsemen at full speed driving off cattle and horses to the mountains. We quickened our pace to arrest this proceeding. The rancheria was in charge of a young fellow from New Hampshire, named Marshall. We ascertained from him that his employer was a prisoner to the Americans in San Diego, that the Mexicans were still in possession of the whole of the country except that port, San Francisco and Monterey; that we were near the heart of the enemy's stronghold, whence he drew his supplies of men, cattle, and horses, and that we were now in possession of the great pass to Sonora, by which he expected to retreat, if defeated, to send his prisoners if successful, and to communicate with Mexico.

To appease hunger, however, was the first consideration. Seven of my men eat at one single meal, a full-grown sheep. Our camp was pitched on the road to the Pueblo, leading a little north of west. To the south, down the valley of the Aqua Caliente, lay the road to San Diego. Above us was Mr. Warner's backwoods, American-looking house, built

of adobe and covered with a thatched roof. Around, were the thatched huts of the more than half-naked Indians, who are held in a sort of serfdom by the master of the rancheria. I visited one or two of these huts, and found the inmates living in great poverty. The thermometer was at 30 deg, they had no fires, and no coverings but sheepskins. They told me, that when they were under the charge of the missions they were all comfortable and happy, but since the good priests had been removed, and the missions placed in the hands of the people of the country, they had been ill treated. This change took place in 1836, and many of the missions passed into the hands of the men and their connexions who had effected the change.

Near the house is the source of the Aqua Caliente, a magnificent hot spring, of the temperature of 170 deg. Fahrenheit, discharging from the fissure of a granite rock a large volume of water, which for a long distance down, charges the air with the fumes of sulphuretted hydrogen. Above it, and draining down the same valley, is a cold spring of the temperature of 45 deg. and without the aid of any mechanical instrument, the cold and warm water may be commingled to suit the temperature of the bather.

The Indians have made pools for bathing. They huddle around the basin of the spring to catch the genial warmth of its vapours, and in cold nights immerse themselves in the pools to keep warm. A day will come, no doubt, when the invalid and pleasure-seeking portion of the white race, will assemble here to drink and bathe in these waters, ramble over the hills which surround it on all sides, and sit under the shade of the great live oaks that grow in the valley.

Our information in reference to the state of affairs in California was yet very imperfect and unsatisfactory. Marshall spoke of a Mr. Stokes, an Englishman,

who lived fifteen miles distant, on the road to San Diego. The general at once dispatched Marshall to him, and in three hours he appeared in our camp, presenting a very singular and striking appearance. His dress was a black velvet English hunting-coat, a pair of black velvet trowsers, cut off at the knee and open on the outside to the hip, beneath which were drawers, of spotless white; his leggins were of black buckskin, and his heels armed with spurs six inches long. Above the whole bloomed the broad merry face of Mr. Stokes, the Englishman. He was very frank, proclaimed himself a neutral, but gave us all the information he possessed; which was, that Commodore Stockton was in possession of San Diego, and that all the country between that place and Santa Barbara was in possession of the "country people." He confirmed all that Marshall had said, and stated he was going to San Diego the next morning. The general gave him a letter for that place.

I made observations at night for time and latitude, but the flying clouds, and the trembling ground on which we were encamped, made it a delicate operation.

Information was received on the 2d, that fifteen miles distant, on the road to the Pueblo, a band of horses and mules were cached, belonging to General Flores and others. Tired as our people were, night-fall found twenty-five of them in the saddle, with fresh horses, under the command Lieut. Davidson, accompanied by Carson, on their way in pursuit of the cache. Davidson was successful, and returned with the horses on the 3d, about meridian; but the animals, like those we captured at the mouth of the Gila, were mostly unbroken, and not of much service.

My observations give for the latitude of our camp at this date, which was on the meadow to the south of the rancheria, 33 deg. 16 min. 57 sec.

We remained in camp on the 3d to rest.

December 4.—The morning was murky, and we did not start till 9 o'clock, about which time it commenced to rain heavily, and the rain lasted all day. Our route was chiefly through narrow valleys overtopped by high hills of some fertility, covered with oaks. We were now in the region of rains, and the vegetation, though not luxuriant, was very much changed, but it was too late in the fall to get the flowers or fruits to determine the plants.

Our camp was pitched, after marching $13\frac{1}{2}$ miles, in the valley of the Rio Isabel, near the rancheria of Mr. Stokes, formerly the mission of Saint Isabel.

Mr. S. had gone, but he left his keys with a man whom the Spaniards called Signor Beel, with directions to entertain us. The Signor was a deserter from an English merchantman, and had lived in the neighbouring mountains some ten years; during this time he had acquired a little property, and some knowledge of the Spanish, but the sailor was visible in all his acts. Before night Mr. Beel had made good use of his keys, and shone in his true colours as sailor Bill.

We were drenched to the skin, and looked forward with some pleasure to the idea of once more entering a house, with a blazing fire and plenty to eat and drink. In the last two items we were entirely satisfied, but sadly disappointed in finding no fire, the only chimney about the rancheria being in the kitchen.

The dragoons took the dinner intended for the officers, and we were obliged to stand, cracking our heels in the cold damp chapel, now converted into a hall, for two hours, before the Signor, or rather Sailor Bill, could cook another dinner.

The appearance of desolation which the rancheria presents is little calculated to impress us with favourable notions of the agricultural resources of this

part of California. The land in the narrow valleys is good, but surrounded everywhere by high barren mountains, and where the land is good, the seasons are too dry for men to attempt cultivation without facilities for irrigation.

December 5.—A cold rainy day, and the naked Indians of the rancheria gathered around our fires. We marched from the rancheria of San Isabel to that of Santa Maria. On the way we met Captain Gillespie, Lieutenant Beale, and Midshipman Duncan of the navy, with a party of thirty-five men, sent from San Diego with a despatch to General Kearny. We arrived at the rancheria after dark, where we heard that the enemy was in force nine miles distant, and not finding any grass about the rancheria, we pushed on and encamped in a canon two miles below. It was long after night when we halted, and though there may have been plenty of grass, we could not find it. Besides the rain, a heavy fog obscured the landscape, and little could be seen of the country during the day's journeying; what we did see, however, did not impress us favourably as to its fertility.

Although this was the rainy season, no flowing streams were crossed after leaving the San Isabel, and the ground was destitute of grass. Our camp was in a valley, overgrown with large oak trees and other shrubbery; but it was too dark to distinguish their character.

A party under Lieut. Hammond was sent to reconnoitre the enemy, reported to be near at hand. By some accident the party was discovered, and the enemy placed on the *qui vive*. We were now on the main road to San Diego, all the "bye-ways" being in our rear, and it was therefore deemed necessary to attack the enemy, and force a passage. About 2 o'clock, A. M., the call to horse was sounded.

December 6.—We marched nine miles before day-

break over a hilly country, leaving our packs to come on in the rear. The general invited Mr. Warner and myself to ride with him, and taking four of my party, I left Messrs. Bestor and Stanly with the rest, six in number, to take care of the baggage, and look after the instruments and notes.

When within a mile of the enemy, whose force was not known to us, his fires shone brightly. The general and his party were in advance, preceded only by the advanced guard of twelve men under Captain Johnston. He ordered a trot, then a charge, and soon we found ourselves engaged in a hand-to-hand conflict with a largely superior force.

For an account of this engagement, reference may be made to the official report of the general, which has been published. As day dawned, the smoke cleared away, and we commenced collecting our dead and wounded. We found eighteen of our officers and men were killed on the field, and thirteen wounded.

Amongst the killed were Captain Moore and Johnston, and Lieutenant Hammond of the 1st dragoons.

The general, Capt. Gillespie, Capt. Gibson, Lieut. Warner, and Mr. Robideau, badly wounded.

A large body of horsemen were soon in our rear, and fears were entertained lest Major Swords and the baggage should fall into their hands. The general directed me to take a party of men and go back for Major Swords and his party. We met at the foot of the first hill, a mile in rear of the enemy's first position. Returning, I scoured the village to look for the dead and wounded. The first object which met my eye was the manly figure of Captain Johnston. He was perfectly lifeless, a ball having passed directly through the centre of his head.

The work of plundering the dead had already commenced; his watch was gone, nothing being left of it but a fragment of the gold chain by which it was

suspended from his neck. By my directions Sergeant Falls and four men took charge of the body and carried it into camp. Captain Johnson and one dragoon were the only persons either killed or wounded on our side in the fight by fire-arms.

Information was received that the dead, no matter where buried, would be dug up to rob the bodies of their clothes, and orders were given to pack them on mules, with the intention of carrying them to San Diego, but it was found that there were not a sufficient number of strong animals left to convey both the dead and the wounded, and directions were given therefore to inter them at night as secretly as possible.

When night closed in, the bodies of the dead were buried under a willow to the east of our camp, with no other accompaniment than the howling of myriads of wolves, attracted by the smell. Thus were put to rest together, and for ever, a band a brave and heroic men. The long march of 2,000 miles had brought our little command, both officers and men, to know each other well. Community of hardships, dangers, and privations, had produced relations of mutual regard, which caused their loss to sink deeply in our memories.

The general's wounds were so serious, that during the day Captain Turner assumed command and directed operations. There was but one surgeon in our party, Dr. Griffin, and notwithstanding his great skill and assiduity, he did not finish dressing the wounded till late in the afternoon, nor were the ambulances for their transportation completed. This, with the desire to bury our dead under cover of night, caused the forward movement to be postponed till morning.

Our provisions were exhausted, our horses dead, our mules on their last legs, and our men, now reduced to one-third of their number, were ragged,

worn down by fatigue, and emaciated. The officers of Captain Gillespie's party said there were wheel-carriages at San Diego, 39 miles distant, and it was determined to send there for the means of conveying our wounded. Early in the day, Godey, with a few picked men, was on his way by a circuitous route to that place.

Our position was defensible, but the ground, covered with rocks and cacti, made it difficult to get a smooth place to rest, even for the wounded. The night was cold and damp, and notwithstanding our excessive fatigues of the day and night previous, sleep was impossible.

December 7.—Day dawned on the most tattered and ill-fed detachment of men that ever the United States mustered under her colours. The enemy's pickets and a portion of his force were seen in front. The sick, by the indefatigable exertions of Dr. Griffin, were doing well, and the general enabled to mount his horse. The order to march was given, and we moved off to offer the enemy battle, accompanied by our wounded, and the whole of our packs. The ambulances grated on the ground, and the sufferings of the wounded were very distressing. We had made for them the most comfortable conveyance we could, and such as it was, we were indebted principally to the ingenuity of the three remaining mountain men of the party, Peterson, Londeau, and Perrot. The fourth, the brave Francois Menard, had lost his life in the fight of the day before. The general resumed the command, placing Captain Turner, of the dragoons, in command of the remnant of dragoons, which were consolidated into one company.

Arranging our wounded and the packs in the centre, we marched towards San Diego in the direction of the San Barnardo rancheria, taking the right hand road over the hills, and leaving the river San

Barnardo to the left. The enemy retired as we advanced. When we arrived at the rancheria of San Barnardo, we watered our horses and killed chickens for the sick. The rancheria was the property of Mr. Snooks, an Englishman; it was deserted except by a few Indians.

Finding no grass about the rancheria, we moved on towards the bed of the river, driving many cattle before us. We had scarcely left the house and proceeded more than a mile, when a cloud of cavalry debouched from the hills in our rear, and a portion of them dashed at full speed to occupy a hill by which we must pass, while the remainder threatened our rear. Thirty or forty of them got possession of the hill, and it was necessary to drive them from it. This was accomplished by a small party of six or eight, upon whom the Californians delivered their fire; and strange to say, not one of our men fell. The capture of the hill was then but the work of a moment, and when we reached the crest, the Californians had mounted their horses and were in full flight. We did not lose a man in the skirmish, but they had several badly wounded. By this movement we lost our cattle, and were convinced that if we attempted any further progress with the ambulances we must lose our sick and our packs. It was impossible to move in the open field with these incumbrances, against an enemy more than twice our number and all superbly mounted. The general, therefore, determined to halt for the night, to have the wounds of the sick redressed, and then to cut our way to San Diego.

December 8.—We bored holes for water, and killed the fattest of our mules for meat. In the morning a flag of truce was sent into our camp, informing us that Andres Pico, the commander of the Mexican forces, had just captured four Americans, and wished to exchange them for a like number of Californians.

We had but one to exchange, and with this fellow I was sent to Andres Pico, whom I found to be a gentlemanly-looking and rather handsome man.

The conversation was short; for I saw the man he wished to exchange was Burgess, one of those sent on the morning of the 6th to San Diego, and we were very anxious to know the result of his mission. Taking rather a contemptuous leave of his late captors, he informed us of the safe arrival of himself and Godey at San Diego. He also stated that when captured, his party consisting of himself and two others, on their return from San Diego, had previously "cached" their letters under a tree, which he pointed out; but on subsequent examination, we found the letters had been abstracted.

Our wounded were still in no condition to move; to have attempted to transport them would have required one-half of our fighting force, and it was decided most expedient to wait until they could be carried on horseback. At night, Lieutenant Beale, of the navy, Mr. Carson, and an Indian, volunteered to go to San Diego, 29 miles distant—an expedition of some peril, as the enemy now occupied all the passes to that town.

The observations made to-night give for the latitude of this camp, 33 deg. 03 min. 42 sec., and the longitude 117 deg. 03 min. 29 sec.

Don Antonio Robideaux, a thin man of fifty-five years, slept next to me. The loss of blood from his wounds, added to the coldness of the night, 28 deg. Fahrenheit made me think he would never see daylight, but I was mistaken. He woke me to ask if I did not smell coffee, and expressed the belief that a cup of that beverage would save his life, and that nothing else would. Not knowing that there had been any coffee in the camp for many days, I supposed a dream had carried him back to the cafes of St. Louis and New Orleans, and it was with some surprise I

found my cook heating a cup of coffee over a small fire made of wild sage. One of the most agreeable little offices performed in my life, and I believe in the cook's to whom the coffee belonged, was, to pour this precious draught into the waning body of our friend Robideaux. His warmth returned, and with it hopes of life. In gratitude he gave me, what was then a great rarity, the half of a cake made of brown flour almost black with dirt, and which had, for greater security, been hidden in the clothes of his Mexican servant, a man who scorned ablutions. I ate more than half without inspection, when, on breaking a piece the bodies of several of the most loathsome insects were exposed to my view. My hunger, however, overcame my fastidiousness, and the morceau did not appear particularly disgusting till after our arrival at San Diego, when several hearty meals had taken off the keenness of my appetite, and suffered my taste to be more delicate.

Last night the brave Sergeant Cox died of his wounds, and was buried to-day deep in the ground, and covered with heavy stones, to prevent the wolves from tearing him up. This was a gallant fellow, who had, just before leaving Fort Leavenworth, married a pretty wife.

December 10.—The enemy attacked our camp, driving before them a band of wild horses, with which they hoped to produce a *stampede*. Our men behaved with admirable coolness, turning off the wild animals dexterously. Two or three of the fattest were killed in the charge, and formed in the shape of a gravy soup, an agreeable substitute for the poor steaks of our worn-down brutes, on which we had been feeding for a number of days.

Doctor Griffin gave the welcome information that all the sick, but two, were able to get into the saddle, and orders were given to march the next morning.

There was little expectation that Carson and

Lieutenant Beale would succeed in reaching San Diego; the hiding-place pointed out by Burgess were examined, and the letters from San Diego were not found.

We were all reposing quietly, but not sleeping, waiting for the break of day, when we were to go down and give the enemy another defeat. One of the men, in the part of the camp assigned to my defence, reported that he heard a man speaking in English.—In a few minutes we heard the tramp of a column, followed by the hail of a sentinel. It was a detachment of one hundred tars and eighty marines under Lieutenant Gray, sent to meet us by Commodore Stockton, from whom we learned that Lieutenant Beale, Carson, and the Indian had arrived safely at San Diego. The detachment left San Diego on the night of the 9th, cached themselves during the day of the 10th, and joined us on the night of that day.—These gallant fellows busied themselves till day distributing their provisions and clothes to our naked and hungry people.

December 11.—The junction of our forces was a complete surprise to the enemy, and when the sun rose, but a small squadron of horse was to be seen at Stokes's rancheira. They had fled precipitately, leaving most of the cattle behind them, for which we had been contending for the last three days. None of our men were mounted—theirs were all mounted; and why they should have left their stock is inconceivable. It was certainly not incompatible with their safety to have carried them all away. The only way of accounting for it is, by supposing our night attack had filled them with the unnecessary fear of being surprised. We drove the cattle before us.

Our march was in close order, over a road leading through a rolling country of light black soil, destitute of trees, and without water, covered with oats indigenous to the soil, now falling to decay. The grass in

protected places was sprouting, but not in sufficient quantity to afford grazing to our stock. After marching twelve miles, we arrived at the rancheria of Signor Alvarado, a person who was in the fight against us. The women and children had fled to the mountains, leaving plenty of turkeys, chickens, goats, and sheep behind; also two casks of wine, the produce of the country. The havoc committed on the comestibles was immense; the sheep not killed were driven by us into San Diego. The owner had taken the oath of allegiance to the United States, and broken it.

The navy took a prisoner at this house, as they marched to meet us. He gave us much information, and was then liberated. He stated that Pico's force consisted of one hundred and sixty men, one hundred of which was drawn from the Pueblo, and the balance from the surrounding country. We subsequently received authentic accounts that his number was one hundred and eighty men engaged in the fight, and that one hundred additional men were sent him from the Pueblo, who reached his camp on the 7th.

There was a fine spring at this rancheria, and another two miles below it.

On the hill, before reaching the rancheria, the Pacific opened for the first time to our view, the sight producing strange but agreeable emotions. One of the mountain men, who had never seen the ocean before, opened his arms and exclaimed, "Lord! there is a great prairie without a tree."

December 12.—We followed the Solidad through a deep fertile valley in the shape of a cross. Here we ascended to the left a steep hill to the table lands, which, keeping for a few miles, we descended into a waterless valley, leading into False Bay, distant two or three miles from San Diego. At this place we were in view of the fort overlooking the town of San Diego and the barren waste which surrounds it.

The town consists of a few adobe houses, two or

three of which only have plank floors. It is situated at the foot of a high hill on a sand-flat, two miles wide, reaching from the head of San Diego Bay to False Bay. A high promontory, of nearly the same width, runs into the sea four or five miles, and is connected by the flat with the main-land. The road to the hide-houses leads on the east side of this promontory, and abreast of them the frigate Congress and the sloop Portsmouth are at anchor. The hide-houses are a collection of store-houses where the hides of cattle are packed before being shipped ; this article forming the only trade of the little town.

The bay is a narrow arm of the sea indenting the land some four or five miles, easily defended, and having twenty feet of water at the lowest tide. The rise is said to be five feet, making the greatest water twenty-five feet.

Standing on the hill which overlooks the town, and looking to the north-east, I saw the mission of San Diego, a fine large building now deserted. The Rio San Diego runs under-ground in a direct course from the mission to the town, and sweeping around the hill, discharges itself into the bay. Its original debouche was into False Bay, where, meeting the waters rolling in from the seaward, a bar was formed by the deposit of sand, making the entrance of False Bay impracticable.

Well grounded fears are entertained that the immense quantity of sand discharged by this river will materially injure, if it does not destroy the harbour of San Diego ; but this evil could be arrested at a slight cost, compared with the objects to be obtained. At present San Diego is, all things considered, perhaps one of the best harbours on the coast from Callao to Puget's Sound, with a single exception, that of San Francisco. In the opinion of some intelligent navy officers, it is preferable even to this. The harbour of San Francisco has more water, but

that of San Diego has a more uniform climate, better anchorage, and perfect security from winds in any direction. However, the commercial metropolis must be at San Francisco, owing to the greater extent and superiority of the country adjacent, watered by the rivers Sacramento and San Joachim, unless indeed San Diego should be made the terminus of a railroad leading by the route of the Gila to the Del Norte, and thence to the Mississippi and the Atlantic.

The rain fell in torrents as we entered the town, and it was my singular fate here, as in Santa Fe, to be quartered in the calaboose, a miserable hut, of one room, some 40 by 30 feet square. A huge old gun was mounted in this hovel, looking through an embrasure to the westward. In this building I was told that I could stow my party and my instruments safely.

We preferred the open air and the muddy plaza, saturated with all sorts of filth, to this wretched hole; but having no alternative, our chronometers and instruments were stowed in it and guarded by the indefatigable Mr. Bestor. I went off to accept the hospitality of a friend the first bed I had seen in many months. About midnight there was one of those false alarms which ever and anon disturbed this goodly town. Four burly fellows rushed to man this gun, but they found themselves unexpectedly opposed by Mr. Bestor and two or three of my party. But for this timely resistance, my whole little stock of chronometers, barometer, &c., would have been totally destroyed. In the morning, through the kind exertions of my friend, Captain Gillespie, I was enabled to get a house with two rooms, the only unoccupied quarters in the town. Foreseeing employment of a different nature, my little party occupied themselves busily in collecting and bringing up the notes of our field-work.

On the 28th December I received notification from

General Kearny to leave my party in San Diego and report to him for duty, as the acting adjutant-general of the forces; Captain Turner, his adjutant-general, having been assigned by him to the command of the remnant of the company of the 1st dragoons.

Lieut. Warner was still too unwell, from the wounds received at San Pasqual, to accompany us, or to commence the survey of San Diego Bay. Wishing to have a secure place to deposit my instruments, notes, &c., I applied to Captain Dupont to give them a place on board the Cyane. He granted this request, and kindly insisted that Mr. Bestor and Mr. Stanly should also go on board, where they could pursue their work unmolested.

I should be very ungrateful if I did not here make my acknowledgements to Captain Dupont, and all the officers of the navy with whom we were thrown in contact, for the uniform kindness and the generous hospitality with which they always supplied our personal wants, and the promptness with which they rendered assistance in my public enterprise.

The harbour of San Diego has been surveyed by Captain Sir Edward Belcher, of the royal navy, whose determination of the longitude of the spit to the south of Punta Loma, published in his "*Voyage round the World*," has been adopted, in the absence of time or instruments, to enable me to make the requisite observations.

The longitude of the same point by Malispina, 117 deg. 17 sec. and the chronometric longitude brought by myself from my last station over the mountains, where lunar distances were observed, 117 deg. 14 sec.; but I have not hesitated to take the results of Sir Edward Belcher, although I have had no opportunity of seeing his observations.

Malispina's observations were made long since, and the results from the chronometers brought over-land

by me are liable to objections: first, from the imperfection in the determination of my intermediate stations by lunar distances, and, next, from the disturbances to which the chronometers were subjected in the battle of the 6th of December, and the skirmish of the 7th, but more particularly the last, where a sudden charge was made, in an open plain, on our baggage, by the enemy's cavalry.

The harbour was originally explored by Sebastian Vizcaino in 1603, but no settlement was made at San Diego until 1769.

Vessels may ride at anchor in the harbour, perfectly land-locked; but in very heavy southerly gales, some inconvenience may be felt by those not provided with good ground-tackle, from the immense volumes of kelp driven into the harbour.

The kelp (*fucus giganteus*) occupies a space in front of the harbour some miles in length and a mile wide. At a distance, I took the kelp for a low island, but was informed of my error by Captain Schenck, who told me vessels were forced through it in a stiff breeze.

On the morning of the 29th December, we marched out of San Diego with the following force:

Dragoons—1 captain, 1 lieutenant, 2 sergeants, 4 corporals, 2 buglers, 47 privates.

Sailors acting artillery—1 captain, 1 lieutenant, 2 sergeants, 4 corporals, 39 privates.

Sailors and marines acting infantry—8 captains, 10 lieutenants, 17 sergeants, 17 corporals, 345 privates.

Volunteers—3 captains, 3 lieutenants, 6 sergeants, 48 privates.

Three employees of the topographical engineers, three medical officers, and twenty-five men, Indians, and Californians. The whole divided into four divisions or battalions, commanded by Lieutenant Rowan, Captain Turner, Lieutenant Renshaw, Lieutenant Zielin, and Captain Gillespie.

Six pieces of artillery, of various calibre, got up with great exertion, under the order of Commodore Stockton, by Lieutenant Tilghman of the navy, acting as captain of artillery.

A waggon-train, consisting of one four-wheel carriage and ten ox carts, under the charge of Lieutenant Minor, of the navy. The waggons were heavily laden, and our progress was slow in the extreme. We did not reach the Solidad, the first watering place, till eight o'clock at night.

I was ordered to ride forward and lay out a defensive camp, hoping to give confidence to the sailors, many of whom were now, for the first time, transferred to a new element.

We soon found their habits of discipline aboard ship made the transition easy, and I speedily arrived at the conclusion, that Jack, properly handled, made a very good infantry soldier.

The plan of the camp being approved, I was directed to make it the habitual order of encamping wherever the configuration of the ground would admit. The plan was the natural one to protect ourselves from the night attacks of the enemy, who were all mounted. The mode in which they designed to make their night attacks was, to drive into our camp a "manada" of wild mares, and then take advantage of the confusion they might create to deliver a charge.

December 30.—We encamped at the ranchero of Alvear.

December 31.—We encamped at the San Barnardo, having gone in three days only thirty miles. The ground passed over was the same as that described in the last two days of our march into San Diego.

January 1.—To-day we obtained some fresh oxen and a few fresh horses, which enabled us to do better and make seventeen miles before sunset. Our road to-day diverged from that heretofore described, and

laid over a rolling country, destitute of water and trees. Cattle were seen, in small numbers, covering the plains in all directions, proving to us that the enemy had found it impracticable to fulfil their boast, that we should not get a hoof from the day we left San Diego.

We pitched our camp at the Indian settlement of Buena Vista, passing by the way a deserted rancheria, where there was a puddle of stagnant water, the only water on the route.

January 2.—Six and a half miles march brought us to the deserted mission of San Luis Rey. The keys of this mission were in charge of the alcalde of the Indian village, a mile distant. He was at the door to receive us and deliver up possession.

There we halted for the day, to let the sailors, who suffered dreadfully from sore feet, recruit a little.

This building is one which, for magnitude, convenience and durability of architecture, would do honour to any country.

The walls are adobe, and the roofs of well made tile. It was built about sixty years since by the Indians of the country, under the guidance of a zealous priest. At that time the Indians were very numerous, and under the absolute sway of the missionaries. These missionaries at one time bid fair to Christianize the Indians of California. Under grants from the Mexican government, they collected them into missions, built immense houses, and commenced successfully to till the soil by the hands of the Indians for the benefit of the Indians.

The habits of the priests, and the avarice of the military rulers of the territory, however, soon converted these missions into instruments of oppression and slavery of the Indian race.

The revolution of 1836 saw the downfall of the priests, and most of these missions passed by fraud into

the hands of private individuals, and with them the Indians were transferred as serfs of the land.

This race, which, in our country, has never been reduced to slavery, is in that degraded condition throughout California, and do the only labour performed in the country. Nothing can exceed their present degraded condition.

For negligence or refusal to work, the lash is freely applied, and in many instances life has been taken by the Californians without being held accountable by the laws of the land.

This mission of San Luis Rey was, until the invasion of California by the Americans, in 1846, considered as public property. Just before that event took place, a sale was made of it for a small consideration, by the Mexican authorities, to some of their own people, who felt their power passing away, and wished to turn an *honest penny* whilst their power was left; but this sale was undoubtedly fraudulent, and will, I trust, not be acknowledged by the American government. Many other missions have been transferred in the same way; and the new government of California must be very pure in its administration to avoid the temptations which these fictitious sales, made by the retiring Mexican authorities, offer for accumulating large fortunes at the expense of the government.

The lands belonging to this mission are extensive, well watered, and very fertile. It is said, and I believe it probable from appearances, that wheat will grow in the valleys adjacent, without irrigation.

January 3.—After marching a few miles the wide Pacific opened to our view. We passed the St. Marguerita rancheria, once a dependency of San Luis Rey, now in the possession of the Pico family. We encamped near Flores, a deserted mission. Just below it, and near the ocean, is an Indian village. Cattle were seen in great numbers to-day, and

several well broken pairs of oxen were picked up on the way.

Distance 10.5 miles.

January 4.—After leaving Flores a few miles, the high broken ground projects close in upon the sea, leaving but a narrow, uneven banquette, along which the road wends through a growth of chaparral.

Here we met three persons, bearing a flag of truce ; one an Englishman, named Workman ; another Fluge, a German ; the third a Californian.

They brought a letter from Flores, who signed himself governor and captain-general of the department of California, proposing to suspend hostilities in California, and leave the battle to be fought elsewhere between the United States and Mexico, upon which was to depend the fate of California. There was a great deal of other matter in the letter, useless to repeat. The commission returned with a peremptory refusal of the proposition of the governor and Captain-General Flores.

After going nine miles from Flores, the high land impinges so close upon the sea that the road lies along the sea-beach for a distance of eight miles. Fortunately for us the tide was out, and we had the advantage of a hard, smooth road. Notwithstanding this, our column stretched out a great distance, and we were compelled to make frequent halts for the rear to come up.

This pass presents a formidable military obstacle, and, in the hands of an intrepid and skilful enemy, we could have been severely checked, if not beaten back from it ; but we passed unmolested, and encamped late at night on an open plain at the mouth of the stream leading from the mission of San Juan de Capristano, and about two miles from the mission.

It was so dark I could not see to lay off the lines of the camp accurately, and I was glad, in the morn-

ing, that an early start gave no time for criticism. Distance 18.8 miles.

January 5.—The mission of San Juan has passed into the hands of the Pico family. The cathedral was once a fine strong building, with an arched cupola; only one-half of the building, capped by a segment of the cupola, is now standing, the other part having been thrown down by an earthquake in the year 1822, killing some thirty or forty persons who had fled to it for refuge.

Attracted by a house having a brush fence round the door, as if to keep out intruders, I was told there were four men within, in the agonies of death, from wounds received at the battle of San Pasqual.

We moved to the Alisos rancheria, where we found a spring of good water, but nothing to eat. Through the kindness of Mr. Foster, an Englishman, we received here a supply of fresh horses.

The road was principally through the valley of the stream watering the mission. On each side were beautiful rounded hills, covered with a delicate tinge of green from the grass which was now sprouting freely near the sea-coast.

Up to this point, except a small patch at Flores, I had not seen the mark of a plough or any other instrument of husbandry. The rancherias were entirely supported by rearing cattle and horses. Distance 11.1 miles.

January 6.—To-day we made a long march of 19 miles to the upper Santa Anna, a town situated on the river of the same name. We were now near the enemy, and the town gave the evidence of it. Not a soul was to be seen; the few persons remaining in it were old women, who, on our approach had bolted their doors. The leaders of the Californians, as a means of inciting their people to arms, made them believe we would plunder their houses and violate their women.

Taking advantage of a deep ditch for one face of the camp, it was laid off in a very defensible position between the town and the river, expecting the men would have an undisturbed night's rest, to be in the morning ready for the fight, which might now be expected daily. In this hope we were mistaken. The wind blew a hurricane, (something very unusual in this part of California,) and the atmosphere was filled with particles of fine dust, so that one could not see and but with difficulty breathe.

January 7.—The wind continued to blow violently, which the enemy should have taken advantage of to attack us. Our weapons were chiefly firearms; his, the lance; and I was quite certain that in such a gale of wind as then blew, the difficulty of loading our arms would have proved a serious matter.

The Santa Anna is a fine dashing stream, knee-deep, and about 100 yards wide, flowing over a sandy bed. In its valley are many valuable vineyards and corn fields. It is capable of affording water to a great many more. On its banks are considerable tracts of uncultivated land within the level of irrigation. We now began to think there would be more formidable and united resistance by the enemy, and such was the unanimity of the men, women, and children in support of the war, that not a particle of information could be obtained in reference to his force or position.

After travelling ten miles we came to the Coyotes, a rancheria owned by a rich widow lady, who had just married a handsome young fellow, who might well pass for her son. These people we found at home, and we learned from them that the enemy intended to give us battle the next day. Indeed, as we approached the rancheria, several horsemen drew off, reconnoitering us so closely as to make it doubtful if they were not some of our own vaqueros.

January 8.—We passed over a country destitute

of wood and water, undulating and gently dipping towards the ocean, which was in view. About two o'clock we came in sight of the San Gabriel river. Small squads of horsemen began to show themselves on either flank, and it became quite apparent the enemy intended to dispute the passage of the river.

Our progress was necessarily very slow, our oxen being poor, and our waggons (the ox carts of the country) with wheels only about two feet in diameter.

The enemy did not yet discover his order of battle, and we moved to the river in our habitual order of march, when near the enemy, viz: the 2nd division in front, and the 1st and 3rd on the right and left flanks respectively; the guard and a company of volunteer carabiniers in the rear; our cattle and the waggon-train in the centre, making for them, what the sailors wittingly termed a Yankee "*corral*." The artillery were distributed on the four angles of the rectangle.

This order of march was adopted from the character of the enemy's force, all of which was mounted; and in a measure from our own men being unaccustomed to field evolutions, it was necessary to keep them habitually in the order to resist cavalry attacks when in view of the enemy. We had no cavalry, and the object of the enemy was to deprive us of our cattle by sudden charges.

The river was about one hundred yards wide, knee-deep, and flowing over quicksand. Either side was fringed with a thick undergrowth. The approach on our side was level; that on the enemy's was favourable to him. A bank fifty feet high, ranged parallel with the river, at point-blank cannon distance, upon which he posted his artillery.

As we neared the thicket, we received the scattering fire of the enemy's sharp-shooters. At the same moment, we saw him place four pieces of artillery on the hill, so as to command the passage. A

squadron of 250 cavalry just showed their heads above the hill, to the right of the battery, and the same number were seen to occupy a position on the left.

The 2nd battalion was ordered to deploy as skirmishers, and cross the river. As the line was about the middle of the river, the enemy opened his battery, and made the water fly with grape and round shot. Our artillery was now ordered to cross—it was unlimbered, pulled over by the men, and placed in counter battery on the enemy's side of the river. Our people, very brisk in firing, made the fire of the enemy wild and uncertain. Under this cover, the waggons and cattle were forced with great labour across the river, the bottom of which was quicksand.

Whilst this was going on, our rear was attacked by a very bold charge, and repulsed.

On the right bank of the river there was a natural banquette, breast high. Under this the line was deployed. To this accident of the ground is to be attributed the little loss we sustained from the enemy's artillery, which showered grape and round shot over our heads. In an hour and twenty minutes our baggage train had all crossed, the artillery of the enemy was silenced, and a charge made on the hill.

Half-way between the hill and river, the enemy made a furious charge on our left flank. At the same moment, our right was threatened. The 1st and 2nd battalions were thrown into squares, and after firing one or two rounds, drove off the enemy. The right wing was ordered to form a square, but seeing the enemy hesitate, the order was countermanded; the 1st battalion, which formed the right, was directed to rush for the hill, supposing that would be the contested point, but great was our surprise to find it abandoned.

The enemy pitched his camp on the hills in view, but when morning came he was gone. We had no

means of pursuit, and scarcely the power of locomotion, such was the wretched condition of our waggon-train. The latter it was still deemed necessary to drag along for the purpose of feeding the garrison, intended to be left in the Cuidad de los Angeles, the report being that the enemy intended, if we reached that town, to burn and destroy every article of food. Distance 9.3 miles.

January 9. The grass was very short and young, and our cattle were not much recruited by the night's rest: we commenced our march leisurely, at 9 o'clock, over the "Mesa," a wide plain between the Rio San Gabriel and the Rio San Fernando.

Scattering horsemen, and small reconnoitering parties, hung on our flanks. After marching five or six miles, we saw the enemy's line on our right, above the crest made by a deep indentation in the plain.

Here Flores addressed his men, and called on them to make one more charge; expressed his confidence in their ability to break our line; said that "yesterday he had been deceived in supposing that he was fighting soldiers."

We inclined a little to the left to avoid giving Flores the advantage of the ground to post his artillery; in other respects we continued our march on the Pueblo as if he were not in view.

When we were abreast of him, he opened his artillery at a long distance, and we continued our march without halting, except for a moment, to put a wounded man in the cart, and once to exchange a wounded mule, hitched to one of the guns.

As we advanced, Flores deployed his force, making a horse-shoe in our front, and opened his nine-pounders on our right flank, and two smaller pieces on our front. The shot from the nine-pounders on our flank was so annoying that we halted to silence them. In about fifteen minutes this was done, and

the order "forward" again given, when the enemy came down on our left flank, in a scattering sort of charge; and notwithstanding the efforts of our officers to make their men hold their fire, they, as is usually the case under similar circumstances, delivered it whilst the Californians were yet about a hundred yards distant. This fire knocked many out of their saddles and checked them. A round of grape was then fired upon them, and they scattered. A charge was made simultaneously with this on our rear with about the same success. We all considered this as the beginning of the fight, but it was the end of it. The Californians, the most expert horsemen in the world, stripped the dead horses on the field, without dismounting, and carried off most of their saddles, bridles, and all their dead and wounded on horseback to the hills to the right.

It was about three o'clock, and the town, known to contain great quantities of wine and aguardiente, was four miles distant. From previous experience of the difficulty of controlling men when entering towns, it was determined to cross the river San Fernando, halt there for the night, and enter the town in the morning, with the whole day before us. The distance to-day, 6.2 miles.

After we had pitched our camp, the enemy came down from the hills, and 400 horsemen, with the four pieces of artillery, drew off towards the town, in order and regularity, whilst about sixty made a movement down the river, on our rear and left flank. This led us to suppose they were not yet whipped, as we thought, and that we should have a night attack.

January 10.—Just as we had raised our camp, a flag of truce, borne by Mr. Celis, a Castilian, Mr. Workman, an Englishman, and Alvarado, the owner of the rancheria at the Alison, was brought into camp. They proposed, on behalf of the Californians, to surrender their dear City of the Angels, provided

we would respect property and persons. This was agreed to; but not altogether trusting to the honesty of General Flores, who had once broken his parole, we moved into the town in the same order we should have done if expecting an attack.

It was a wise preception, for the streets were full of desperate and drunken fellows, who brandished their arms, and saluted us with every term of reproach.—The crest, overlooking the town, in rifle range, was covered with horsemen, engaged in the same hospitable manner. One of them had on a dragoon's coat, stolen from the dead body of one of our soldiers, after we had buried him at San Pasqual.

Our men marched steadily on, until crossing the ravine leading into the public square, when a fight took place among the Californians on the hill; one became disarmed, and to avoid death, rolled down the hill towards us, his adversary pursuing and lancing him in the most cold-blooded manner. The man tumbling down the hill was supposed to be one of our vaqueros, and the cry of "Rescue him!" was raised. The crew of the Cyane, nearest the scene, at once, and without any orders, halted, and gave the man that was lancing him, a volley; strange to say, he did not fall. Almost at the same instant, but a little before it, the Californians from the hill did fire on the vaqueros. The rifles were then ordered to clear the hill, which a single fire effected, killing two of the enemy. We were now in possession of the town; great silence and mystery was observed by the Californians in respect to Flores; but we were given to understand that he had gone to fight the force from the north, drive them back, and then starve us out of the town. Towards the close of the day we learned very certainly that Flores, with 150 men, chiefly Sonarians and desperadoes of the country, had fled to Sonora, taking with him four or five hundred of the best horses and mules in the country, the property of

his own friends. The silence of the Californians was now changed into deep and bitter curses upon Flores.

Some slight disorder took place among our men at night, from the facility of getting wine, but the vigilance of the officers soon suppressed it.

January 11.—It rained in tortents all day. I was ordered to select a site, and place a fort, capable of containing a hundred men; with this in view, a rapid reconnoisance of the town was made, and the plan of a fort sketched, so placed as to enable a small garrison to command the town and the principal avenues to it. The plan was approved. Many men came in during the day and surrendered themselves.

January 12.—I laid off the work, and, before night, broke the first ground. The population of the town, and its dependencies, is about 3,000; that of the town itself, about 1,500. It is the centre of wealth and population of the Mexico-Californian people, and has been heretofore the seat of government. Close under the base of the mountains, commanding the passes to Sonora, cut off from the north by the pass at San Barbara, it is the centre of the military power of the Californians. Here all the revolutions have had their origin, and it is the point upon which any Mexican force from Sonora would be directed. It was therefore desirable to establish a fort, which, in case of trouble, should enable a small garrison to hold out till aid might come from San Diego, San Francisco, or Monterey, places which are destined to become the centres of American settlements.

January 13.—It rained steadily all day, and nothing was done on the work; at night I worked on the details of the fort.

Thursday, 14.—We drank to-day the wine of the country, manufactured by Don Luis Vigne, a Frenchman. It was truly delicious, resembling more the best description of Hock than any other wine.

Many bottles were drunk, leaving no headache or acidity on the stomach. We obtained, from the same gentleman, a profusion of grapes and luscious pears, the latter resembling in colour and taste the Bergamot pears, but different in shape, being longer and larger.

January 15.—The details to work on the fort were by companies. I sent to Captain Tilghman, who commanded on the hill, to detach one of the companies under his command to commence the work. He furnished on the 16th, a company of artillery (seamen from the Congress) for the day's work, which they performed bravely, and gave me great hopes of success.

January 18, 19, and 20.—I received special orders which separated me from the command, and the party of topographical engineers that had been so long under my orders.

The battles of the 6th December, and the 8th and 9th January, had for ever broken the Mexican authority in California, and they were daily coming in, in large parties, to sue for peace, and every move indicated a sincere desire on the part of the more respectable portion of the Californians to yield without further struggle to the United States' authorities ; yet small parties of the more desperate and revengeful hung about the mountains and roads ; refusing or hesitating to yield obedience to their leaders, who now, with great unanimity, determined to lay down their arms. General Flores, with a small force, was known to have taken the road to Sonora, and it was believed he was on his way to that province, never to return to California.

Leaving General Kearny at San Juan de Capristano, on his return to San Diego, I took three men and pushed on for the latter place. Halting late in the evening at the deserted Indian rancheria of Santa Margarita, we broke open one of the Indian huts,

and got some corn and pumpkins for our animals. When night came on, the number of insects about the hut, and the intolerable noise made by the wolves, kept us from sleep. The moon shone brightly, and about ten at night we saddled up to pursue our journey.

In this determination we were confirmed by the unexplained movement of several small parties of mounted Californians that reconnoitred our camp; a circumstance which afforded additional proof that some of the Californians were yet in arms, and led us very reasonably to the conclusion that our only safety was in changing our camp. We reached the mission of San Luis Rey, and found not a human being stirring. The immense pile of building, illuminated by the pale cold rays of the moon, stood out in bold relief on the dim horizon, a monument of the zeal of the indefatigable priests by whom it was built. Now untenanted and deserted, it offered no resting place for the weary and hungry, and we rode on, determined to halt at the first place where grass should be in abundance.

The road here divides into two branches; one leads to the west, by the rancheria of San Barnardo, the other directly to San Diego, over the high lands, running nearly parallel to the sea-coast. The first is that by which we had marched on the Pueblo de los Angeles, fearing that the hills on the sea-coast road would embarrass the movement of our military and ox-carts.

Without a guide, we had great difficulty in striking at night the trail leading over the mountains; but consulting the stars for our course, and relying upon the sagacity of my three men, who had passed most of their days in traversing untrodden regions, we jogged along, shivering with the cold air of the elevated hills.

About twelve, we came to a large patch of luxuriant

grass, wet with dew. Upon this we loosened our animals and attempted to get a little sleep, but, in the absence of blankets or fire, the cold deprived us of repose, and the dawn of day found us again in our saddles.

The only habitation on the road from San Luis Rey to San Diego is a hut about half way, where there is a good spring. Its occupants had just returned from the wars, quite as hungry as we were. They had preceded us not more than twenty minutes, yet they had a fat bullock killed, and choice bits of his flesh roasting before the fire. We out-numbered the party, and consequently received their hospitality, which was extended to us with a good deal of bon-hommie.

They conversed freely of the battles fought but a few days before, acknowledged their participation in them, and expressed themselves satisfied of the uselessness of further resistance without aid from Mexico.

The fresh meat of a bullock is all that is required by the Californian for breakfast, dinner, and supper.

Bread, tea, and coffee are rarely, if ever used, and even when within their reach, looked upon with indifference.

We very soon fell into their habits, and it is probable the troops in California, at this time, would not consider it an excessive hardship to make a campaign with no other stores in the commissariat than a plentiful supply of fresh beef. The white teeth of the Californians, and the blood tingling in the cheeks of their olive-coloured faces, would seem to prove this beef to be a very healthy diet.

The advantages in the movement of troops that are contented with this kind of subsistence is very great, enabling them to move without waggons, and with no other care for the morrow than herding the animals intending for food.

Our host was so well pleased with the manner in which we acquitted ourselves at his rude repast, that, forgetting old animosities, he saddled up his jaded horse, and piloted us for five or six miles, until we reached the broad trail leading to the Solidad.

About mid-day we reached San Diego, and next morning taking leave of my men and the animals that had done us such good service, I embarked on board the prize brig Malek Adhel, commanded by Lieutenant Schenck, of the navy, and prepared to take my leave of Upper or Alta California. Before doing so, however, I may venture upon a few general remarks, based upon personal observations, upon the topography, climate, and products of that portion of the country not covered by my survey, or that of others. These observations were made after I had become separated from my assistants and instruments, my mind being engrossed with other subjects. The information contained in them is, therefore, less precise than that contained in other portions of my journal.

The region extending from the head of the Gulf of California to the parallel of the Pueblo, or Cuidad de los Angeles, is the only portion not heretofore covered by my own notes and journal, or by the notes and journals of other scientific expeditions fitted out by the United States.

The journals and published accounts of these several expeditions combined, will give definite ideas of all those portions of California susceptible of cultivation or settlement. From this remark is to be excepted the vast basin watered by the Colorado, and the country lying between that river and the range of Cordilleras, represented as running east of the Tulare lakes, and south of the parallel of 36 deg. and the country between the Colorado and Gila rivers.

Of these regions nothing is known except from the reports of trappers, and the speculations of geo-

logists. As far as these accounts go, all concur in representing it as a waste of sand and rock, unadorned with vegetation, poorly watered, and unfit, it is believed, for any of the useful purposes of life.

I have alluded, elsewhere, to the population of this country, the savage character of which is another obstacle in its exploration, and has tended to veil in mystery its true character and resources.

Alta California, between the 31st and 34th parallels of latitude, presents to the eastern man, accustomed to navigable rivers and broad estuaries of the ocean, topographical features of a very unusual character.

Two chains of mountains traverse the country in a direction nearly parallel to the sea-coast, slightly converging towards each other, and finally uniting near the parallel of 32 deg. Here they form the promontory of Lower California, extending its entire length, and terminating abruptly in the ocean at Cape San Lucas.

The first chain (that nearest the coast) may be considered a steppe of the second or interior range of mountains. It impinges on the coast at three different points, Santa Barbara, San Juan de Capristano, and between San Luis Rey and San Diego—at the first two places with so much boldness as to make it necessary to conduct the road along the margin of the sea, between the lines of high and low-water mark, so that both Santa Barbara and San Juan present points worthy of consideration to the military commandant charged with the defence of that country.

Between the first and second ranges of mountains there is a valley, traversed by a good road, leading directly from the great desert to the Pueblo de los Angeles, and a defending force would meet its adversary to the greatest advantage at Cariso creek,

the termination of the "jornada" across the desert. The description and locality of Cariso creek has also been given.

The second or principal range of mountains lies at no great distance from the first, and the valley between offers some arable land. The distance between the first range and the sea-coast varies from one to twenty or thirty miles. The surface, covered with vegetation, though small, is difficult to estimate; and perhaps it is unimportant that an estimate should be made, since the productiveness of these regions depends on other considerations than smoothness of surface and character of soil. The rains cannot be relied upon, and the tiller of the earth depends upon irrigation from the mountain streams for his crops. The extent of ground capable of tillage is thus reduced to very narrow limits, easy of computation. A knowledge of the water-courses, their fall, volume and extent, and the quantity of lands on their margin, within the level of these waters, are the data upon which the computations must be based.

Where irrigation can be had in this country, the produce of the soil is abundant beyond description. All the grains and fruits of the temperate zones, and many of those of the tropical, flourish luxuriantly.

Descending from the heights of San Barnardo to the Pacific, one meets every degree of temperature. Near the coast, the winds prevailing from the south-west in winter, and from the north-west in summer, produce a great uniformity of temperature, and the climate is perhaps unsurpassed in salubrity. With the exception of a very few cases of ague and fever of a mild type, sickness is unknown.

The season of the year at which we visited the country was unfavourable to obtaining a knowledge of its botany. The vegetation, mostly deciduous, had gone to decay, and no flowers nor seeds were collected. The country generally is entirely destitute of

trees. Along the principal range of mountains are a few live oaks, sycamore, and pine ; now and then, but very rarely, the sycamore and cotton-wood occur in the champaign country, immediately on the margins of the streams.

Wild oats every where cover the surface of the hills, and these, with the wild mustard and carrots, furnish good pasturage to the immense herds of cattle which form the staple of California.

Of the many fruits capable of being produced with success, by culture and irrigation, the grape is perhaps that which is brought nearest to perfection.

Men experienced in growing it, and Europeans, pronounce the soil and climate of this part of California unequalled for the quality of the wine expressed from it.

We sailed from San Diego on the 25th of January, and coasted along the rocky and barren shores of Lower California. The information in reference to this country, which it was in my power to obtain, is not so precise as that which might be derived from an actual survey, and I have therefore embodied it in the appendix.

I have the honour to be, very respectfully yours,
W. H. EMORY.

APPENDIX.

NOTES OF LIEUT. J. W. ABERT.

ON the 27th of June, 1846, we set out from Fort Leavenworth. The day was clear and bright; the woods were rejoiced with the voice of the mocking bird, and of the many little warblers that would join in the chorus of his song; the bluebird was there with his sprightly notes, and the meadow lark, perched on some tall mullein weed, caroled forth his song of love. As we were heartily tired of remaining quiet, we were well prepared to enjoy the beautiful scenes that our progress gradually developed. The ground is what is called "rolling prairie," of gentle curves, one swell melting into another.

The soil around is extremely rich; the whole country is verdant with the rank growth of the "tall grass," as it is called by way of eminence, when compared with that which grows beyond the region of the walnut and the hickory.

Here are many varieties of useful timber: the hickory, the walnut, the linden, the ash, the horn-beam, the maple, the birch, and the beech, also the cotton-wood; but beyond the limits of the "tall grass," there is the cotton-wood only.

Five miles from Fort Leavenworth we passed a large butte, called "Pilot Knob;" its top is flat, and unites with the valleys below in a curve like that of a rope slackly drawn; spreading over the valleys, and climbing almost to the top of the butte, we saw fine forests of timber, consisting chiefly of oak. Among the shrubs, we noticed the hazel (*corylus Americanus*), and the button bush (*cephalanthus occidentalis*); among these the wild grape had twisted its tendrils, and was growing so luxuriantly that it was with great difficulty one on horseback could force his way through.

On the hill sides, the wild rose was still in bloom, and mingled its pink flowers with the beautiful white clusters of the Jersey tea (*ceonothus Americanus*). The prairies were covered with tall stalks of the rattlesnake weed (*rudebeckia purpurea*).

Some of our mules proved very refractory, but we soon conquered them with the aid of the "lasso," or cabriesto, as it is often called—a rope of hair, or plaited hide, 50 to 60 feet long, in which a noose is formed, that, by a skilful hand, is easily thrown over the mule's head, the noose being gradually tightened, the animal soon falls, to all appearance lifeless. Now, the bridle, the saddle, and packs are fixed, the noose loosened, and the mule rises ready for the journey.

After a march of twelve miles, we encamped near a log-house, close to a fine spring of cold clear water. Here we noticed the white hickory, or downy hickory (*juglans pubescens*), the chesnut oak (*quercus primus acuminata*), the spicewood (*laurus benzoin*), and, deep in the woods, the modest May apple (*podophyllum peltatum*), and bloodroot (*sanguinaria canadensis*).

As we retired to rest, the sky became cloudy, and in a little time a plentiful shower of rain fell, which annoyed us greatly as it drove through our tents.

28th.—During the early portion of the morning,

the rain continued with some abatement, and, as the sky showed signs of clearing off, we commenced making our arrangements for the march. I went down to a log-house close by, and, whilst examining it, was attracted by the chirping of birds, and, on searching, found that the sound proceeded from the chimney, and I there discovered a beautiful nest, in the shape of a half-basket, firmly attached to the chimney walls with clay, lined internally with horse-hair and soft grass, and covered externally with moss ; within were five unfledged birds, their eyes scarcely open, and at every sound they heard they would open their mouths and scream for food. The anxious parent several times darted down near my head. I wished much to ascertain its species, but, although it lit on the trees near the house, I could not get near enough to make any decision, and, as I did not desire to kill a bird with young, I had to content myself with the name some of our people gave it, to whom I pointed it out, and who called it the "grey bird."

After some little trouble with the mules, we got off about seven o'clock ; the rain had made the roads slippery, and the wheels cut into the soft mould so that the mules laboured hard ; at length we reached a sudden rise, where, in spite of our efforts, we were obliged to remain until one of the volunteer teamsters, seeing our difficulty, kindly brought us three yoke of oxen, and soon drew us up the slope. Passing on over gently rising and falling swells and valleys, with the delightful breeze that one almost always meets on the prairies, we felt our spirits rising with the clearing away of the clouds, and when the sun broke forth in splendour, the sensation was truly exhilarating. Whenever we rode to one side of the road, we noticed that our horses would frequently sink to the fetlock, and saw on the ground little piles of loose earth, like small ant-hills, being about five

inches high and ten or twelve inches in diameter at the base, and without any opening ; they are formed by the sand-rats or gophers (*pseudostoma bursarius*,) and although their habitations cover the prairies, there are few persons I have met with who have ever seen them.

On our route we started several prairie chickens (*tetrao cupida*). After a march of eleven miles we reached Stranger Creek, a romantic little stream of water, clear as crystal, that ripples over a pebbly bottom. The banks are high and composed of rich loam that nourishes immense oaks and sycamores (*platanus occidentalis*). The banks were now so slippery from the rain, and so steep withal, that we were necessitated to unload our waggons before we could achieve the ascent. We were soon encamped, and had our bedding exposed to the sun to dry. We noticed a great quantity of the orange-coloured *asclepias* (*asclepias tuberosa*), around which gaudy butterflies were flitting. The low grounds near us were covered with a prickly button-head rush (*eryngium aquaticum*), the roots of which, when candied over, formed the kissing comfits of Falstaff.

The woods were skirted by a dense growth of hazel, plumtrees, and tangled grape vines. Here, too, we found the little quail (*ortix virginiana*), suddenly rising up from under our feet, and startling us with the whizzing sound of its wings. This evening the mosquitoes were very numerous, and we lay down to be tormented with these provoking pests ; but few of us were able to sleep, although none of us slept very comfortably last night.

29th.—Yesterday evening, we found that the hind axletree of our waggon had been split in crossing the creek ; and, being fearful lest we should break down at some place where good timber could not be obtained, we sent out two men to procure a piece of

timber, and they soon brought in a fine piece of hickory, dragging it into camp by the means of a "lasso" that they had affixed to it, and had then passed round the neck of a mule. Luckily for us, there was a good carpenter in the volunteer camp, and although his tools consisted only of a saw, an axe, a drawing-knife, and an auger, he, nevertheless, managed to fashion a very good axletree. This work detained us until one o'clock, when we started for the Kansas river, having, through the kindness of Colonel Ruff, obtained a new teamster in place of the one who deserted last night.

The prairie was yet what is called rolling ; the flat bottoms were covered with the rosin weed or polas plant (*simplicium laciniatum*), whose pinnate-parted leaves have their lobes extending like fingers on each side of the mid-rib. It is said that the planes of the leaves of this plant are coincident with the plane of the meridian ; but these I have noticed must have been influenced by some local attraction that deranged their polarity.

The orange coloured *asclepias* (*A. tuberosa*) and the *melanthium virginicum*, a white-flowering bush, were also abundant.

The timber on the ravines consisted of the white oak (*Q. alba*), black jack oak (*Q. ferraginea*), mulberry (*morus rubra*), walnut (*F. nigra*), the hickory, the red bud (*ericis canadensis*). The nettles (*urtica canadensis*) had grown to the height of seven or eight feet, all of which show the prodigal fertility of the soil.

As we approached the Kansas river its tributaries seemed to multiply rapidly, and the rolls in the prairie became more abrupt.

At three o'clock, we ascended a high ridge that gave us a fine view of the whole surrounding country. Presently reaching a little stream, whose banks

were excessively steep and slippery, the waggons attempted to ascend ; but one of the waggon wheels sank deep in the mud, and completely stopped all progress ; we were therefore obliged to unload everything, and then clap all hands to the wheel, when we rose the hill amid the cheers of the men. A Frenchman, mounted on a wild mule, had already crossed and was standing on the western bank, which is ten or twelve feet in height, when the mule suddenly sprung off the bank into the creek, just grazing with its feet the head of one of the men over whom it passed in its desperate leap. No one was hurt, and the Frenchman still sat as firm as ever.

As we neared the Kaw or Kansas river, some of us went in advance and soon reached an Indian-house ; the occupants said they were Shawnees. They appeared to be very comfortably fixed ; had plenty of fine-looking cattle, pigs, and chickens ; within a few yards of the house, a clear stream of good water spouted forth from the side of a hill. We learned from the Indians that the distance to the Kaw river was a mile and a half.

Crossing a high ridge, we enter the Kansas bottom ; it was overgrown with a tall grass (*arundo phragmites*), from five to six feet high, and mingled with this was the long-leaved willow and the cotton-wood. A quarter of a mile from the river bank, we entered the timber, consisting of the varieties already mentioned ; the ground on which it grew was a deep loose sand, difficult to get through.

In the river we found two large flat boats or scows, manned by Shawnee Indians, dressed in bright-coloured shirts, with shawls around their heads. The current of the river was very rapid, so that it required the greatest exertions on the part of our ferrymen to prevent the boats from being swept far down the stream. We landed just at the mouth of Wakaroosa

creek. Here there is no perceptible current; the creek is fourteen feet deep, while the river does not average more than five feet, and in several places is quite shoal.

It was nearly ten o'clock before all our company had crossed, and was so dark that we could scarcely see to arrange camp; so we lay down on the river bank and sent our horses out on the prairie to graze. We finished our supper at twelve o'clock and lay down again to sleep; but, worn out as we were, the mosquitoes showed us no compassion, and large hooting owls (*bubo virginianus*), as if to condole with us, commenced a serenade.

The pure cold water of the Wakaroosa looked so inviting that some of us could not refrain from plunging beneath its crystal surface; one of the flat boats formed a convenient place from which to spring. The sun was rising, surrounded by golden clouds; in one of the flat boats, three of the Indians who had assisted in ferrying us over were soundly sleeping, and far away stretched the gradually diminishing trees that overhung the Kansas water; the kingfisher (*alcedo alcyon*) was darting along, uttering his shrill rattling scream; flocks of paroquets (*centurus Carolinensis*) were circling over head, and screaming and darting amid the tall walnut and sycamore trees.

We now made ready for our march, having engaged a fine-looking Indian lad to go with the party. Our horses had not had much time to eat last night, and seemed disinclined to pass through the luxuriant grass that lay on each side of our road, and were constantly trying to snatch a mouthful of the delicious herbage.

At a quarter past 8, we had a glimpse of the Wakaroosa buttes; on our right there was a large corn-field, of about thirty acres, then a line of timber stretching as far as the eye could reach; on our left lay the broad rolling prairie, and directly in

front we could see the road crossing the swells of the prairie, until it could be no longer distinguished. As we continued to advance we found that our road led us directly between the two buttes.

We soon reached them, and then saw the "divide" that separates the waters of the Wakaroosa" from those of the "Alaris des Cygnes," or Osage (as it is called near its mouth); upon this divide the Santa Fe road is laid out.

We soon saw the Oregon trail, which here unites with that to Santa Fe; shortly after passing the junction of these trails, we reached a steep declivity that forms the bank of a small stream, and noticed that the Indians had been working here for coal; in the superincumbent shale we found traces of fossils resembling the broad flat leaves of the iris (*fridæ*). While we were examining this formation, my horse, that had been driven almost mad by the flies (*tabani*), broke from his fastenings and rushed into the creek, in order to roll in the water, and thus free himself from his tormentors. What a misfortune!—for my saddle and pistols were on his back; some of the party dashed towards him, and, springing up, he galloped off, scattering all my accoutrements on the road; but I recovered every thing, even my pistols.

We continued on over a broad flat bottom of marshy land, but found, before we had proceeded far, that our course bore too much to the north. We, however, continued to follow on, in hopes it would take a turn, but were disappointed. As it was now late, we encamped on the Wakaroosa river, having marched nine miles. During the day, our animals suffered greatly from the horse-fly (*tabani*); these flies completely covered the necks and shoulders of the horses and mules, tormenting them excessively.

Amongst the birds observed this day, were the dove (*ectopistes Caroliniensis*), the flicker (*gieus*

auratus), the blue-bird (*sialia Wilsonii*), the bunting (*pipilo erythrosthalmus*), and the crow (*corvus Americanus*). The last-mentioned birds were lounging near a large corn-field, and were, doubtless, watching with interest the ripening of the grain.

Those friends of the prairie voyageur, the crow-bird (*molothrus precoris*), made their appearance, and no sooner had we picketed our animals, than those birds installed themselves on their backs.

The elder (*sambucus pubescens*) was still in bloom, and the orange *asclepias* still displaying its gaudy flowers, much to the delight of the brilliant butterflies that sported around it, and are so constantly found near it, that it is often called the butterfly-plant.

Our camp is on a high point which separates the branches of a little stream; the grass around is good, and our situation high, and must bid defiance to the mosquitoes. Along the margin of the creek I found a beautiful lily (*lilium tigrinum*), of a bright orange colour, and beautifully dotted.

On *July 1*, we arose early, and made our way back to the trail we had left. After a march of three miles, we reached the route sought for; we then rose to the top of the "divide," which unites with the Wakaroosa valley, by a series of slopes that resemble the exterior slopes of parapets, their crests changing direction so suddenly, as to form sharp angles like those of a bastion; we ascended 15 feet, and on taking a bearing back, found that the Wakaroosa buttes were north 40 deg. east.

After travelling three miles further, we reached the broad trail of the traders from Independence, Missouri, to Santa Fe.

As our horses moved on through the grass, the horse-flies seemed to be shaken from the spikelets, as the farina from the stamens of corn, when shaken by the wind; then, rising up, they covered

the heads and necks of the poor animals, making them frantic with pain ; they would rub against each other, and stamp their hoofs ; and some would place their heads so as to get the benefit of the switchings of another's tail ; and even the riders were annoyed by their desperate efforts to get rid of these persecutors.

Before we had proceeded far, we met an old man driving an ox-team ; he had accompanied some of the volunteer companies to carry provisions ; and, having emptied his waggon, he was now on his return. He told us that it was twenty miles from the next pool to water, so we determined to camp soon ; and, having made a march of eleven miles, we pitched our tents on the very same spot on which we had encamped one year previous. Here we collected some beautiful flowers, amongst which were the *rudbeckia hirta*, and the delicate bed-straw (*galium tinctorum*).

The stream upon which we were was then merely a line of unconnected pools. The only trees to be seen were some tall elms (*ulmes Amer.*), in whose tops several turkey vultures (*cathartes aura*) were preparing to go to roost, while below, among the willow brush that bordered the stream, some cat-birds (*orpheus carol*), kept up a low conversation as they plunged into the inmost recesses of the undergrowth.

July 2.—As we had the twenty mile stretch to make to-day without water, we arose early. The dew last night had been very heavy, and we found little pools of water standing on the tops of our mosquito bars, for we had been obliged to desert the tent where our bars could not be fixed conveniently.

The mounds made by the gophers or sand-rats were more abundant than heretofore, and in several places a number of these mounds had been made so close together that the distinctness of each was completely lost in the mass, covering an area of five or six feet.

Our road was full of plovers (*charadicus marmoratus*) ; they would run along before us with great rapidity ; then stop until we approached quite close, when they would run off again. Thus they kept travelling before us all day. We shot several of them, and I preserved some of their skins, more as a memento of the prairies than as a curiosity, for these birds are very abundant in the United States, from Canada to the Gulf of Mexico.

As we proceeded on our journey, we heard the confused hum of thousands of grasshoppers, now and then broken by the chirping of the cricket. These insects are found in great abundance, and obtain greater size than any I have seen elsewhere. I got a cricket this morning that measured $1\frac{1}{2}$ inches in the length of its body.

We now entered on the level prairie, where nothing was to be seen but a wide expanse of green grass, and the sky above filled with cumulus clouds, the shadows of which, as they fell on us, added to the refreshing effects of the delightful breeze one generally meets upon the prairie. After travelling a long distance over a country, the irregularities of which were so imperceptible that one almost doubted their existence, we reached that position which I took to be the top of the divide. Here lay the half devoured carcass of an ox that had, doubtless, succumbed to the fatigues of the journey and deprivation of water ; for these animals suffer much more from want of water than the mule. Some turkey vultures, sailing above our heads, showed that they were not ignorant of the locality of the carrion.

In a little while after passing the ox's carcass, we reached 110 mile creek, which is 22 miles distant from our last night's camp. At this creek there is a fine grove of timber, containing all the varieties found in the vicinity of Kansas river.

About 12 o'clock we reached this creek, and we here found the robin (*turdus migratorius*), the catbird and the blue-bird; and, high above us, the swallow tailed hawk (*nauclerus fuscatus*) was sweeping round in graceful circles, its white head glancing in the sunlight. I asked the Indian lad to shoot it for me with his rifle; but he gazed upwards at the bird, and seemed so struck with the beauty of its movements that he uttered not a word, but shook his head, to signify that the bird was too fair for him to kill it. I should think it impossible for smaller birds ever to escape this hawk, which unites the form and swiftness of the swallow with the boldness and strength of the falcon.

Nigh the banks of the stream there was a low piece of ground covered with the purple monarda (*monarda allophylla*). The gaudy butterflies that I have spoken of before, as flitting around the *asclepias*, were now sucking the sweets of these flowers.

Before we had fairly pitched our tents, young Mr. Nourse, of Washington City, entered our camp. He had, alone, boldly set off from Fort Leavenworth, the day after we had left, determined to overtake us. We were delighted at his safe arrival; nor were we less pleased when we found that he had brought letters from the friends and relatives whom we had left behind.

July 3.—We arose early in the morning to gain as much of the cool portion of the day as possible, determined to push on and see if we could not get rid of the flies that are so troublesome to our horses. The poor brutes seem to have no time to graze; and, when picketed out, they employ their feeding time in rolling in the grass and kicking frantically, so that the ground resounds with the stamping of their hoofs; and, in taking observations with the aid of the artificial horizon, one is obliged to select a spot

at some distance from the horses, to prevent the jar which they produce from disturbing the surface of the mercury. The season appears to be unusually dry; 110 mile creek, which at this time last year was full of water, now has only a few scattered pools in its bed.

All day we had a brisk breeze from the southwest, making the travelling very pleasant. The plover and cowbirds were playing along the road in front of us, and catching the grasshoppers that were scattered around in unlimited profusion.

At 10 o'clock, having marched 15 miles, we reached Independence creek, so called by Colonel Fremont, in consequence of our encamping here on the 4th of July, one year previous. This creek contains the only running water we have seen since leaving our camp by the Wakaroosa river. Along the roadside, I gathered a plant called lamb's-quarter, (*chenopodium album*,) the plaintain weed, (*plantago major*,) and a beautiful sensitive plant, with a yellow flower, slightly resembling the violet, (*cassia chamaecrista*).

We encamped seven miles beyond Independence creek, in a ravine timbered with the elm, the cottonwood, the hickory and the oak. Some of our hunters went out and killed several wild turkeys, (*meleagris gallopavo*). We saw a flock of curlews, (*numenius longirostris*), and some teal, (*anas carol*).

Saturday July 4—At 5½ o'clock, this morning, we crossed the creek upon which we had encamped, and soon reached an elevated piece of ground, from whence we could see our road crossing a high ridge in a direction S. 60 deg. W. Whilst prosecuting our march we noticed two distant spots in the horizon; and, as we neared them, we judged from the white light that one of the objects reflected, that

they might be mounted men. Before long we met them, and found our conjectures correct. They said they were traders, and had been as far as Council grove.

At 7 o'clock, we crossed a stream of running water; at 8 o'clock, we reached one composed of pools, its banks heavily timbered with walnut, and we also noticed the buckeye, (*pavia lutea*,) and, skirting the stream, gooseberry bushes, (*ribes triflorum*,) and elder. At 12 o'clock we reached Rock Creek. This stream is very appropriately named, as its banks chiefly consists of rock. Near where the road crosses there is a large pool from four to five feet in depth, forming a fine bathing place; but we did not stop here, as we were anxious to reach some eminent place in honour of the day. We pushed forward for "Big John spring," which we reached at 5 o'clock. Here we luxuriated on the delightful cool water of this celebrated spring, reclining under the shade of a tall oak "subtegmne querci," at whose base this spring originates; the temperature of the water being only 53 deg., while that of the air ranges above 80 deg.

We saw to-day two beautiful varieties of the evening primrose, (*œnothera biennis*,) the white and yellow. We noticed amongst the birds the brown thrush, (*orpheus rufus*,) the king bird, (*muscicapa tyrannus*,) the grouse (*tetrao cupido*,) and the little quail.

Sunday, July 5th.—We wished, as we started this morning, that we could have taken this spring along with us, the water was so beautifully clear and so cold, and the spring shaded from a distance around by a grove of the walnut, the sycamore, and the oak, around the trunk of which the ivy (*rhus radicans*) clambered, and at the roots of which grew beautiful lychnis.

Two miles from our point of departure is Council Grove, where there is a fine stream of running water, and great quantites of quartz and fossiliferous limestone.

Shortly before we came to Council Grove, we passed the grave of a white man, who had been murdered by an Osage Indian; a circular pile of stones marks his resting-place; from the crevices between the stones, the ivy has shot forth; over the grave a long pole leans mournfully. When I viewed this simple grave, my mind turned to the proud monuments which are built up by the wealthy in our great cities, and which are daily levelled with the ground, to give place to some improvement. Here, on the wild prairie, the Indian and the rude hunter pass by this spot, and not for worlds would they remove one stone.

Continuing our march, we travelled over a distance of 20 miles, when we reached "Diamond Spring." This is a fine large spring, of three or four feet across, the water extremely cold; the temperature of the spring is 54 deg., while that of the air, the thermometer in the shade, is 87 deg.

I procured at this place a beautiful white thistle, (*chicus acarna*), of delicious fragrance. We saw a great many night-hawks (*chordeiles virgins*) and plovers, as well as several herds of deer, (*cervus virginianus*.) I also collected some of the great grasshoppers of the prairies.

Monday, July 6th.—As we set out on our march, the waggon mules took a freak in their heads and endeavoured to run off with the provision waggon, but the driver turned them into the wide prairie, and soon succeeded in quieting them for the time, but he had several trials for the mastery before the day's march was over. After travelling 15 miles, we ar-

rived at "Lost Spring," but did not stop as its appearance was not inviting.

We noticed near the road several large puff-balls or fungi, that resembled, both in size and appearance, human skulls of most beautiful whiteness; the under side is puckered as if a napkin had been thrown over a round body and drawn with a string; the interior resembles flour, except that it coheres.

Continuing our journey, we pressed forward rapidly, in order to reach Cottonwood Fork, which is nearly thirty miles from the place where we were encamped this morning. We had a tedious march and did not reach the creek until 3 o'clock.

Our animals were very much jaded, and add to this that, the moment we reached our goal, myriads of horse-flies attacked our cavalcade furiously. In the efforts of the beasts to rid themselves of the flies, they often became entangled in the "cabrestoes;" we were obliged to protect some of them by loose clothing; the mosquitoes, too, were troublesome to horses and riders.

Cottonwood Fork is a tributary of the Neosha, as well as Council grove creek and the waters intermediate. This stream is timbered with large cottonwood trees that keep a continued rustling of their leaves, for the slightest breeze makes them tremble.

We noticed here thickets of the elder, (*S. canadensis*) in full bloom. The beautiful monarda (*M. allophtyla*) covered the low portions of the banks of this stream, while on the little sand-bars, and close to the water's edge, a dense growth of the long leaved willows overhung the clear water, in which sported the black bass, and the sun-fish. Just where the road crosses, there is a fine pool of water, from five to six feet deep and twelve feet wide.

Tuesday, July 7.—We concluded that it would be best to remain here for the day, as our animals looked

much harassed by what they have already undergone. We employed ourselves in getting all our affairs arranged in complete order; for we expect that this is the last stop that we shall make for some time to come. Everything was overhauled, our clothes were all washed, and all those arrangements, such as a journey of this kind suggests, but which our continued movement did not permit us to accomplish, were this day executed.

Around our camp the ground looked golden with the different varieties of the golden rod, (*solidago*,) and also along the stream we saw box elder, (*acer negundo*,) and extended thickets of plum bushes.

Not far from the camp we saw some antelope, (*dicranocerus furcifer*,) so we sent out an old voyageur with the Indian hunter in pursuit of them; but they returned unsuccessful, and reported that the antelope were extremely shy.

About four o'clock several companies of volunteers made their appearance, and until it was quite late we heard the tramp of horses, the clashing of sabres, and jingling of spurs; at last they all arrived, and the camp was quiet, save the howl of the sentinel wolf.

Wednesday, July 8.—At five o'clock this morning we were on the route for the Turkey creeks; they are three in number, and unite a few miles below the points where our road crosses them; the day was pleasant, for the sky was overcast.

We had now reached the short grass, that is not more than four or five inches in length, and we saw little patches of the true buffalo grass, (*sesleria dactyloides*,) a short and curly grass, so unique in its general character, that it at once catches the eye of the traveller.

On either side of us we observed little circular spots marking the places where the buffalo once wallowed; for these huge animals have a habit of

throwing themselves on their sides upon the ground ; they then commence walking, as it were, with their feet on the circumference of a circle ; this causes their bodies to revolve, and thus result circular depressions in the prairies ; these, after a rain, are for a long time filled with water, with which the traveller is often fain to slake his thirst.

These old wallows are now overgrown with plants that grow more luxuriantly than on other portions of the prairie. There is the splendid coreopsis (*coreopsis tinctoria*) and the silver margined euphorbia ; (*euphorbia marginata*;) these at once arrest the attention.

It is seldom, now, that the buffalo range this far ; no signs of old excrements are to be seen, and the bleached bones left upon the plains by the hunter have long since mouldered away. Towards the close of the day we found the frontal bone of a buffalo's skull, the only sign, in addition to the wallows, of this animal having been once abundant.

Along the road were numbers of the beetle, laying in their winter stores, "haud nonignari aut inculta futuri." We stopped to noon at $11\frac{1}{2}$ o'clock. After a halt of half an hour, we started again, and at $12\frac{1}{2}$ o'clock formed our camp on Turkey creek. Here not a stick of timber is to be seen, but we found some beautiful plants with brilliant scarlet flowers (*malva pedata*) and roots which are eatable. We also obtained specimens of pomme blanche, (*psoralea esculenta*,) and in the waters of Turkey creek we caught some sun perch and catfish.

The men killed several rattlesnakes near our camp, and one a gray snake, marked with a row of blackish spots along the back ; it is said never to exceed two feet in length, and is called the gray rattlesnake. Before dark the sky became black with clouds, whose

appearance was soon followed by a heavy shower of rain.

This day, 9th, at daylight, we struck our tents and commenced our march; heavy clouds were at intervals passing over us and completely deluging us with rain. When the rain would cease, we would stop a few moments and let our animals rest. We noticed some buffalo skulls near the road; they must have lain here many years, as they were crumbling to pieces. At 3 o'clock we reached the Little Arkansas, a tributary of the great river, the name of which it bears. This stream is from five to eight feet in width, and averages five inches in depth; on its banks were some large elms and box-elder; we also saw the common elder, (*sambucus*), narrow-leaved willow, and the grape, (*vitis aestivalis*), the sorel, (*oxalis stricta*) and lamb's quarter (*chenopodium album*), grew near to the stream.

The rain had ceased as we entered camp, and as the antelope appeared abundant and at no great distance, Menard was sent to shoot some of them, but his gun had got so wet during the day it would not fire.

We noticed to-day the pink sensitive plant (*schranksia uncinata*) of most delicious fragrance, so that my hat, into which I had thrust some specimens, was pleasantly perfumed. With this plant, we also found a white variety, (*darlingtonia brachypoda*), the flowers and leaves are smaller than the plant first mentioned, and has no odour.

Late in the evening several of the volunteer companies came up; they said they were suffering for want of provisions; as the commissary waggons had got on too far, in advance, they sent forward to have some of them return. But we were all suffering from a cause that produced in some of us feelings more unpleasant than hunger; the blowfly had

peopled our blankets with living masses of corruption; it is said that these insects were never before seen so far out in the prairies.

Friday, 10th.—It is still raining, the clouds are chasing each other rapidly across the sky, and now and then rain pours heavily down. We remained in camp some time waiting for the rain to stop. We thus lost several hours, but we found travelling in the prairies rather increase the chafing of our animals. We noticed to-day, some swallows, (*hirundo bicolor*,) also the turtle dove, the little quail, the blue jay, (*garulus cristatus*,) and the king-fisher (*alcedo alcyon*).

We collected some lamb's-quarter and had it cooked, and noticed along the roadside the purslane, (*portulaca oleracea*;) this also would answer for the table of the prairie voyageur. Our day's journey was 16 miles.

Saturday, 11th.—We were up this morning at 3½ o'clock, and ready for the start. Our arrangement of mosquito bars was broken in upon last night by a heavy shower of rain that forced us to retreat to our tents.

After marching three miles, we reached Cow creek; it is very difficult to cross on account of the miry bottom, but we got safely over without great delay. Before we had proceeded far, we caught sight of the "plum buttes," bearing N. 20 deg. W. We passed through a large village of prairie dogs, (*Arctomys Ludoviciana*;) although now deserted, there were fresh signs of the dogs having thrown out some earth from their excavations. Last night's rain had, doubtless, forced them to leave their houses. In the ponds that had settled on the plain, we saw several craw-fish, and the crickets were gathered around some ant hills. As our waggons moved along the road, the lizards (*lacerta lineatus*) were

darting along the ruts in front of it, anxious to escape being crushed. The common land turtle (*testudo clausa*) were also very abundant. As we got quite near the Plum buttes, we caught sight of the buffaloes, (*bos Americanus*,) and some five or six of our party immediately gave chase. The buffaloes ran around in a circle of three-fourths of a mile in diameter: so those who were near the centre of this circle had an excellent view of the chase. Holster pistols were the only arms used, and we soon had the pleasure of seeing one of the animals fall; the others then turned off into the wide prairie.

Near the buttes we collected some beautiful Gaillardias of different species. *Gaillardia amblyodon* and *G. pinnatifida* we found abundant over the remainder of our day's route. After a march of eight miles more we reached the banks of the Arkansas river, where we encamped. Here we found a large train of waggons, belonging to Messrs. Hoffman, of Baltimore.

Sunday, July 12.—We left the Arkansas and marched to Walnut creek, where we found Mr. Hoffman's party, they having started before day-break. We here noticed the prairie gourd (*cucumis perennis*) and the cactus, (*cactus opunta*;) also the "pinette de prairie," or *liatris pychnostachia*, with a great abundance of the common sunflower, (*helianthus annuus*;) the bright scarlet malva (*malva pedata*) and the silver-edged euphorbia, (*E. marginata*;) also the purslane, the convolvulus (*ipomen leptophylla*) *rudbeckia hirta*, and a species of cockle burr; and on all sides the little mounds of loose earth thrown up by the gopher, (*psedostoma brissarius*).

We left Walnut creek at 3 o'clock, and entered upon vast plains of the buffalo grass, (*sesleria dactyloides*). After a march of 11 miles we camped within five miles of the famed Pawnee creek. Our

camp was a mile from the river; but we drove our horses to water, and got our buckets filled. As there was no wood, we used the "bois de vache," and lay down near the smoke of the fires to avoid mosquitoes. We had no sticks to support our mosquito bars. When we first arrived, the country around was covered with buffalo, but it was too late in the day to hunt; we therefore lay down quietly with the intention of having a fierce chase in the morning.

July 13th.—Last night we had a terrible serenade from a large drove of prairie wolves, (*canis latrons*). These animals always hang on the heels of the buffalo, to pick up the infirm and those the hunters have wounded, as well as to prey on what is left of the slaughtered.

We got off in good time, and Lieutenant Emory, in company of one of our hunters, started for the buffalo. We saw the chase; as the herd would divide, and let the horsemen pass through, we heard the rumbling sound of their many feet; but at last they crossed the bluff that extends towards the north from Pawnee rock, and were lost to our view. Lieutenant Emory killed one of the herd; but our hunter came into camp empty-handed. We halted a short time to pack the buffalo meat, and then proceeded to Ash creek. This creek was dry, so we continued our route among herds of buffalo that were continually dashing across our road, and at length reached Pawnee fork after a march of 18 miles.

The waters of this creek were so high that we could not cross; the trees along the sides of the banks were half-hidden; the whirling eddies were rushing along with great velocity; the willows that grew on the bank were waving under the strong pressure of the water, and brush and large logs were hurriedly borne along on the turbid bosom of the stream. We therefore camped by the side of the creek to await the

subsiding of its waters. The country around was covered with the (*cucumis perennis*) prairie gourd, and we found it to be infested with those little striped insects that so much annoy the farmer in the United States, by the ravages they commit among the young vines.

This creek is timbered with the elm, (*ulmus Americana*,) and the box elder, (*aceo negundo*). We frequently, during the day, noticed the purslane and the "pinette de prairie;" in the low grounds the splendid coreopsis and the euphorbia were displaying their beauties; and on the uplands the prickly pear was seen in great abundance, but it had passed its bloom.

During the afternoon a man by the name of Hughes was drowned in attempting to cross the stream; there were two men with him at the time, but the current was so violent that it soon swept him out of reach. His friends brought his clothes to our camp, where they left them until they could recover the body.

We saw to-day large flocks of the tropical or yellow-headed blackbird, (*agelajus xantocephalus*,) also the common blackbird, (*quis calus versicolor*,) and the Baltimore oriole, (*icterus Baltimore*).

July 14th.—We were obliged to remain here all day, still waiting the pleasures of the waters. In the meanwhile I set one of the men to work to dig up a root of the beautiful prairie convolvulus, (*ipomea leptophylla*). This man worked for several hours, for the ground was extremely hard, so that he was at last obliged to tear it up, leaving much of the top root behind. This root extended for about one foot, and of not more than an inch and a half in diameter, then it suddenly enlarged, forming a great tuber, 2 feet in length and 21 inches in circumference. The Cheyenne Indians told me that

they eat it, that it has a sweet taste, and is good to cure the fever. They call it badger's food, and sometimes the man root, on account of its great size, for they say some of them are as large as a man. We also procured here the Mexican poppy, (*argemone Mexicana*;) noticed quantities of a willow brush, and several specimens of the tooth-ache-tree, (*near zanthoxylum fraxinum*). This morning Laing brought me a very large toad, (*rana musica*,) far exceeding any I ever before have seen. During the day I made a sketch of the country around our camp; the most recognizable feature is the bluff just on the west side of the stream, close to the ford.

In the evening some of us went over to visit Mr. Hoffman's camp; one of the gentlemen attached to the party had just returned from his first hunt, having killed four fat cows, and brought in their tongues.— Thus far we have noticed several plants that have been so common that I have neglected to mention them. One is the lead plant, or tea plant (*amorpha canescens*), and is in some places so abundant, as to displace almost every other herb; the other is what our men call prairie indigo (*baptisia leucantha*); it bears a large black cylindrical pod, filled with kidney-shaped seed.

July 15th.—This morning we commenced making a raft, determined to wait no longer, and by sundown completed a raft of dry wood, capable of bearing one thousand pounds, without being overloaded. The men worked with great energy, and it was truly exciting to see them straddle the huge logs, and float down in the rapid current, whose waters were rushing along with such a fierce rapidity, dimpling the surface of the stream with miniature whirlpools, and making the willows, now covered midway by the inundating waters, bend and spring as if moved by a hurricane. Sometimes rafts of brush and loose logs

came rushing along, but the men stuck fast to the logs they bestrode, screaming out in wild excitement, as if to drown the gurgling sound of the wild waters.

To-day we saw several large white cranes, with black-tipped wings, (*grus Americanus*,) and Laing killed me some rattlesnakes, (*crotalus horridus*,) and several prairie snakes. Along the creek we found abundance of plums (*prunus virgins*) and cherries.

Thursday 16th—As our raft was now completed we commenced crossing all our camp equipage, and by 11 o'clock everyt hing was safely transferred to the south side of the stream. We were obliged to carry over much less at a time than we had hoped to have done, for our raft, built of the driest wood that we could find, became water-logged. The elm and box elder were the only trees we could get, and when green the specific gravity is but little less than that of water. The waggon body was placed upon the raft to distribute the weight that might be placed in it equably. A rope was stretched across on which a noose could slide, and this noose, by a long rope, was attached to our raft to prevent its being swept away in case the stretched rope should break. This precaution proved most wise, as the rope did break, but the knots upon it prevented the noose from sliding off, and our craft swung round into an eddy where it was comparatively calm.

We now proceeded to cross our cavalcade; some of the horses were first driven and went bravely over; others were very troublesome, but at length, seeing their companions enjoying the luxuriant grass, they all plunged in and arrived safe on the opposite side. Some had to struggle hard to get up the banks, that, in addition to their steepness, were covered with a thick coating of mud, deposited by the waters. It was a beautiful sight to see some of the finest of our horses spring from the high banks of the stream, to

see the splash of spray as it showered around when the horse disappeared, and again to see the noble animal rise above the wave, snorting and dashing the waters from his mane, as he swam for the opposite shore. Our Indian lad seemed to enter into the spirit of the scene ; he seized the cabresto of one of the wildest horses and dragged him down into the water ; running out upon the raft, he stood for a moment, and then plunged into the stream, throwing his arms alternately as he dashed across. It is in such scenes as this that the Indians excel ; their fine limbs, dark hair, and flashing eye lend all the imagination could desire to perfect the wild grace of motion, the picturesque of attitude that such occasions develope.

The water had fallen nearly three feet during the past night, and as it still continued to fall, the troops commenced crossing at the regular ford, which is one-fourth of a mile above us ; but lost several of their horses. To-day, the man who was drowned yesterday was buried, his body having been found by our men engaged in rafting. His friends sent to us for his clothes in which to bury him ; and, before the sun went down, he was deposited in his long resting-place : “ requiescat in pace.”

At 11 o'clock, Colonel Doniphan came to our camp, and informed us that General Kearny wished to see us. We afterwards learned that the general had some inquiries to make in regard to the route by the Smoky Hill fork ; a route that Lieutenant Peck and myself had travelled when we were attached to the command of Colonel Fremont ; but the roughness of that country, the absence of all roads, and the scarcity of water and wood, and the poverty of the pasturage, render the Arkansas river route much to be preferred.

At three o'clock we commenced our march, and

soon struck a road that we pursued until near ten o'clock at night, when we encamped near some pools of water, having been made aware of our approach to them some time before they were in sight, by the cry of the killdeer plovers (*charadrius vociferous*). We soon kindled our fires of "bois de vache," and then found we had encamped in a prairie dog village; a bad place for picketing horses, as the neighbourhood is generally destitute of grass. On our march we obtained a singular species of cactus, resembling roundish bodies covered with long protuberances, whose tips were crowned with stars of white spines (*near mammillaria sulcata*).

We saw during the day many skylarks (*alauda alpestris*); they allowed us to approach quite close before they took wing, and as they flew through the air sang sweetly.

Friday, 17th.—We have now entered that portion of the prairie that well deserves to be considered part of the great desert. The short, curly buffalo grass (*sesleria dactyloides*) is seen in all directions; the plain is dotted with cacti and thistle (*carduus lanceolatus*), while only in buffalo wallows one meets the silver-margined euphorbia; and in the prairie dog villages, a species of *asclepias* with truncated leaves.

We saw several wild horses; in one group there were three, and with our spy-glasses we had a fine opportunity for examining them. There was a bay, a roan, and a black; they stood for some time gazing at us, as if completely absorbed in looking at the strange sight, when, as we approached, they raised their long flowing tails and dashed off with their long manes waving round their necks, and with a speed that soon carried them out of view. Unlike the mustangs, these looked to be large and beautifully proportioned.

Buffaloes seemed as if trying to surround us. We

saw scarcely anything else far or near. The whole horizon was lined with them, and their figures would sometimes shoot up to an immense height, as their change of position caused the visual rays to pass through mediums of different refracting power, while seeming lakes would spring into existence, whose farthest shore seemed widely separated from us by the broad volume of water that intervened.

There were many dusky wolves (*canis nubilus*) prowling around the buffalo; the latter paid no regard to them, but let the wolves approach without showing the least repugnance, although the wolves devour the young calves and attack the cows at certain periods when they are least able to defend themselves. This species of wolf does not congregate in large packs like the prairie wolf, but roams solitary.

This evening five Pawnee Indians came into our camp. They were on foot, naked, and had their faces painted. As our party was very small, and we knew, from the behaviour of these fellows, that there were plenty of Indians near us, we changed our position for one more defensible. All our horses were picketed close to the camp; the cabrestoes were shortened; waggons and tents arranged, so as to form a perfect ring; the arms examined and the guard doubled; the whole camp was in a state of watchfulness, momentarily expecting an attack. I lay for the greater part of the night by the side of a waggon, with my rifle across the tongue, constantly expecting to see some redskins crawling amongst our horses; but the night was undisturbed, save with the howling of wolves and the bellowing of buffalo.

Saturday, 18th.—This morning, as soon as it was light, we saw a large band of buffalo, not more than 300 yards from us, walking slowly to the ponds close by; they were to the west of us, and as the wind did

not blow towards them they paid but little regard to our proximity.

Some of the patriarchs of the band were on the lead ; they were all moving with slow and measured tread, as it attending a funeral. Now and then some of them would cast a sinister glance towards us, but still continued to move on with the same slow pace. I got my spy-glass, in order to examine them with great minuteness, and then commenced making sketches. Soon there was a general commotion amongst the buffalo ; they raised their tails, tossed their heads into the air ; now and then the bulls would dash at each other, when suddenly the whole band separated into small dense groups that scampered off to the four winds of heaven. We instinctively grasped our guns, not knowing whether friend or foe might appear, and soon saw a number of horsemen urging their jaded steeds under the prickly spur. At every touch the impatient riders gave, the tails of the wearied horses were thrown into the air ; and the slow gait at which they moved showed that they had been riding fast and far. They were pursuing a buffalo of immense size, apparently wounded ; the buffalo now turned, but his intended victim shyed, and as the horsemen passed by, we saw the smoke of several shots burst forth ; the horsemen now turned, and ere long the buffalo lay extended upon the ground. We saw them all dismount, and in a little time after Captain Parsons rode into our camp. We inquired the position of the main body, which we were anxious to rejoin, for ourselves were suffering from the harrassing night we had passed, and our horses were suffering from our being necessitated to picket them so closely for fear of Indians ; and both ourselves and our horses daily suffered for want of water. As we

were moving along, a band of buffaloes ran towards us; but as they passed, kept off some distance, running parallel with the road. Our Indian friend noticed them, and as they passed, dismounted, stooped down and drew up his rifle; as the smoke burst forth from the muzzle of his piece, we saw a fine buffalo cow lash her heels high in the air, and then continue to jump and kick for a quarter of a mile or more, when she fell, and all the rest of the herd gathered around her. We already had the meat of two fat cows, and as the waggons were far from the place where the cow had fallen, she was left to feed the wolves.

The ruts of the road were full of little lizards, sunning themselves; as we approached they would dart swiftly away, manifestly disinclined to play the part of devotees to Juggernaut.

In crossing to the river we found the ground in many places covered with beautiful gallardias (*g. amblyodon*) and the eupatorium, while in the moist grounds we saw the curious dodder twining in its golden tendrils all the plants that grew around it, forming an inextricable entanglement.

Among the birds we saw many of the skylarks and several avosets (*recurvirostra Amer.*). The tail and its coverts white, wings black and white, legs blue, and bill recurved.

When we first struck the river we met with Major Clarke's battalion of artillery, a fine body of troops, well uniformed and of soldierly bearing.

Having marched a few miles along the river bank, we formed our camp, after travelling this day a distance of 19 miles.

Sunday, July 19th.—Marching along the Arkansas bottom one is struck with the variety of swamp grasses. Here we find the triangular grass, (*scirpus triquetus*,) and mingled with it in great abundance

the scouring rush (*equisetum hyemale*) and the beautiful *liatris spicata*.

After we had started, I went back three miles to meet General Kearny, in order to get some one to go with us and show us the exact location of the capture of the party of Texans by Captain Cooke, 1st dragoons, in 1843. General Kearny detailed Lieut. Love, who showed us the spot that we sought. On the south side of the river there is a large grove of cotton-wood trees that extends some distance along the river bank, and is the first grove of any size that the traveller west meets after passing Pawnee fork, which, by the route we came, is 64 miles distant.

In the evening we went to General Kearny's camp to get some of the horses shod. We had expected to have gone not more than three or four miles, but only reached them after a ride of eight miles, so deceived were we with regard to the distance by the purity of the atmosphere. As it was quite late, we concluded to remain here until the camp should overtake us in the morning.

Monday, 20th.—This morning we had not marched far when we saw General Kearny's guard stop and encamp. Soon Lieutenant Emory, who had crossed the river, rode over and informed us that General Kearny was very ill, and ordered one of our waggons to remain for the purpose of conveying the General on by easy stages; for our waggon was light and had good springs, while all the other waggons with the army were without springs and roughly built, like common Santa Fe trade waggons.

This day we made a march of $31\frac{1}{2}$ miles, passing along the top of a barren ridge, between one and two miles from the river. Nothing was to be seen but the curly buffalo grass, now parched by the summer's heat. The sun poured down his rays most lavishly;

the men all dismounted and walked, in order to rest and to relieve themselves from the singular sensation produced by the heat. First one and then another of the party became ill, and several were seized with a severe vomiting.

In the evening I went over to Major Clarke's camp, in order to have an axeltree made. There I saw many who appeared to be ill; amongst them were Captain Weightman and Lieutenant Dorn.

I returned to our camp and passed a sleepless time, listening to the footsteps of the guard; and now and then, the conversation of the French boys broke upon the stillness of the night; they, too, were not able to sleep soundly. We were all extremely anxious with regard to General Kearny's health.

Tuesday, July 21st.—This morning we presented quite a sorry looking array of human faces. At daybreak I was seized with a vomiting, which lasted for some time; I was obliged to send for the doctor. I however determined to push forward, in compliance with the order of Lieutenant Emory, who was with General Kearny, and committed myself to the waggoner's care, while Lieutenant Peck took command of the camp. Lying here, my eye roved over but a confined prospect; under me were bundles of bedding, with blankets, red, blue, and white; near me a sick man, languidly gazing upward; above me, the bended bows of the waggon that supported a large white cover, through which the sun beat with intense heat; and, in front, through a little hole, one caught sight of the landscape dancing to and fro as the waggon jolted along.

We formed our camp, after a march of 11 miles, at the Santa Fe crossing, and in the vicinity of Major Clarke's battalion of artillery, so that we could have an opportunity of completing our axletree

that we began yesterday. We soon saw our waggon, and learned that General Kearny had perfectly recovered.

At this place we obtained some beautiful purple lilies, (*eustoma russeliana*,) and Mr. Nourse brought me a psoralia, with a monosepalous calyx. On the opposite side of the river there are several Indian bodies, wrapped in blankets and skins, exposed on platforms of lodge-poles, high up in cotton-wood trees, where they are safe from wolves and the sacrilegious touch of men. The air of the prairie produces rapid dessication, and, in this respect, resembles that of Egypt, and the islands of the ancient Guanches.

From the 21st of July, until our arrival at Bent's fort, on the 29th, being all the time sick, I have no recollection of anything that transpired, except a drawing that I made of the sand-rat (*pseudostema bursarius*). The body and legs are covered with yellowish brown hair, plumbeous at the base; belly white; anterior claws, strong and large; posterior claws, short; iris, black; ear, projecting slightly.—On each side of the upper jaw are two exterior pouches, 1 4-5 inches in depth; tail covered with short hair, a little less in length than one-half the length of the body; body about six inches in length. The pouch is covered with short white hair, and capable of being turned inside out. This, I think, was a young one; hence the slight differences in the size and the colour of its legs, and the tail being covered with hair.

Captain Turner, of the 1st dragoons, brought me an *ortygometra carolinus*; these birds are in plenty along the Arkansas bottom; this one was caught after a short chase, for it flew a short distance only, when it appeared to be too much fatigued, or too much bewildered to rise again.

As one approaches Bent's fort, he meets with many varieties of artemisia, with the obione canescens, and a plant which is extremely useful to the Mexicans as a substitute for soap, by them called the palmito, by us Adam's needle, or Spanish bayonet; its botanical name is the yucca augustifolia. We also have the prairie gourd, (*cucumis perennis*); that is abundant also from Bent's fort to Santa Fe. We have the bartonia, several species of solanum, several species of œnothera, the martynia, the cleome, the salicornia, ipomœa, and erigonums. Amongst the trees, several varieties of populus, amongst which are the *populus canadensis* and *p. monilifera*; several varieties of *salix*, and the plum and cherry.

Among the animals, we have the panther, (*felis concolor*); the wild cat, (*felis rufa*); the white wolf, (*canis nubilus*); the prairie wolf, (*canis latrans*); the silver-grey fox, (*canis cinerea argentus*); and the prairie fox, (*canis velox*); prairie dog, (*arctomys ludoviciana*); the gopher, (*pseudostoma brissarius*); the antelope, (*dicranocerus furcifer*); the grey bear, (*ursus ferox*); also a species of vespertilia and species of ground-squirrel; it is said that there are three different varieties. Along the Arkansas, where there is sufficient cover, one finds the red deer, (*cer-*
vus virgin); one also finds the badger, (*taxus labra-*
dorus); and the polecat, (*mephitis Amer*). The Indians at the fort showed me a racoon (*procyon lotor*) skin, they said had been obtained in the neighbourhood.

Amongst the birds, the turkey vulture, (*cathartes atra*); wild turkey, (*meleagris gallipavo*); quail, (*ortix virginia*); red-headed woodpecker, (*picus erythrocephalus*); meadow lark, (*sturnella ludo-*
viana); night hawk, (*chorodeiles virgin.*); cow-
birds, (*molothrus pecoris*); dove, (*ectopistes carolin*;
flickers, (*picus auratus*); raven, (*corvus corone*);

and the railtailed buzzard, (*batco borealis*). There has also been found on the Arkansas, within eight miles of Bent's fort, a singular and but little known bird, called the pasana, (*geococyx viaticus*).

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